

Pseudoscorpions (Arachnida: Pseudoscorpiones) from the Galapagos Islands (Ecuador)

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Pseudoscorpions (Arachnida: Pseudoscorpiones) from the Galapagos Islands (Ecuador). - 25 species in ten families are recorded from 25 islands and islets of the Galapagos archipelago. Ten new species are described and figured: *Paraliochthonius galapagensis*, *P. litoralis*, *P. pecki*, *P. rupicola* (Chthoniidae); *Ideoblothrus emigrans*, *I. galapagensis* (Syarinidae); *Serianus elongatus*, *S. maritimus* (Garypinidae); *Garypus granosus* (Garypidae); *Cryptocheiridium confundens* (Cheiridiidae). *Aphelolpium cayanum* Muchmore, 1979 and *Withius piger* (Simon, 1878) are additions to the fauna of the Galapagos; *Ideobisium simile* (Balzan, 1892), *Serianus pusillimus* Beier, 1959 and *Neocheiridium corticum* (Balzan, 1887) are removed from the faunal list of the archipelago. Three new synonymies are proposed: *Atemnus insularis* Banks, 1902 is a junior subjective synonym of *Paratemnoides nidificator* (Balzan, 1888); *Parachernes d. darwiniensis* Beier, 1978 is a junior subjective synonym of *Parachernes nigrimanus* (Banks, 1902); *Parachernes darwiniensis maculosus* Beier, 1978 is a junior subjective synonym of *Parachernes galapagensis* Beier, 1977. *Withius piger* (Simon, 1878) is recorded for the first time from Bermuda. The new combination *Cryptocheiridium insulare* (Vitali-di Castri, 1984) is proposed for *Cheiridium insulare* from Guadeloupe.

Keywords: Taxonomy - distribution - Neotropical region - new species - new records - Bermuda.

INTRODUCTION

The Galapagos Islands (a political province of Ecuador) are situated in the Pacific Ocean, about 1000 km off the South American continent, situated on the equator at the 90th meridian west. This archipelago is composed of 13 major islands larger than 10 km², 6 smaller islands and over 40 islets with official names. Isabela is the largest island, with an area of about 4670 km², and the highest, with a maximum elevation of over 1700 m (Parent *et al.*, 2008). The archipelago is of volcanic origin and the oldest subaerially deposited basaltic rocks are estimated to have an age of no more than 4 million years (my). The islands in the SE part are the oldest (e.g. San Cristobal 3.7, Espanola 3.4, Santa Cruz 2.2 my; Peck, 1990), while the westernmost islands of Isabela and Fernandina are no older than 0.7 my, with considerable modern volcanic activity. There is no geological evidence that the islands have ever been

connected, even not by a chain of islands, with the mainland. The relatively arid climate is mainly influenced by cool oceanic currents and upwellings from May to December, the warm Panama current reaches the archipelago only between December and May (Niedbala & Schatz, 1996). An interesting analysis of the arachnological collecting activities during the last four decades and of the interactions between the vegetation zones and spider communities of the islands of Santa Cruz and Isabela is presented by Baert (2013).

The Galapagos archipelago is considered a hotspot of species endemism (e.g. Steinfartz, 2011), but, in spite of the great interest for biological studies on this archipelago, the pseudoscorpions long remained neglected. Banks (1902) recorded two new species from Albemarle (=Isabela), collected during the Hopkins Stanford Galapagos Expedition (1898-1899): *Atemnus insularis* and *Chelanops nigrimanus*. Both of these species were more or less ignored in the taxonomic literature and cited only sporadically (e.g. Beier, 1940) (see Muchmore, 1999 for the nomenclatural history of *Chelanops nigrimanus*, and Harvey, 1991 for that of *Paratemnoides insularis*). It was only in 1977 that Beier described seven species of pseudoscorpions collected during the Belgian zoological expedition to the Galapagos islands and Ecuador and, in 1978, 10 species and one subspecies based on the collections made by H. Franz in 1975 and some material from the California Academy of Sciences. No supplementary taxonomic data were published subsequently to Beier (1977, 1978), some faunistic or biogeographical papers cited the one or the other pseudoscorpion species (e.g. Baert *et al.*, 1995; Peck, 1990; Peck & Finston, 1993).

ABBREVIATIONS:

| | |
|-----|--------------------------|
| D | deutonymph |
| FIT | flight interception trap |
| P | protonymph |
| T | tritonymph |
| TS | tactile seta |
| UV | ultra-violet |

ACRONYMS OF INSTITUTIONS:

| | |
|-------|--------------------------------------------------------------|
| CAS | California Academy of Sciences, San Francisco |
| CDRS | Charles Darwin Research Station, Santa Cruz, Galapagos |
| MHNG | Muséum d'histoire naturelle de la Ville de Genève |
| MZBE | Museo de Zoologie de Barcelona |
| NHMW | Naturhistorisches Museum Wien |
| RBINS | Royal Belgian Institute of Natural Sciences, Brussels |
| TNSC | Texas Natural Science Center, Austin (Texas Memorial Museum) |

MATERIAL AND METHODS

509 samples, comprising 1864 specimens, have been studied. They were mainly collected during field trips organised since 1965 by several scientific institutes and colleagues, notably Dr Léon Baert and colleagues, Dr Stewart B. Peck, Dr W. G. Reeder, and Drs Heinrich and Ingrid Schatz. The results obtained by N. Leleup

(1965-1965) and H. Franz (1975) published elsewhere are also considered. Information on those collecting activities is compiled by Schatz (1998) and Baert (2013), emphasizing a number of approximately 3600 sampling sites and 3600 sampling days (Baert, 2013)! The large number of samples, collected by scientists working on a variety of animal groups and using different collecting methods, yielded surprising results. The diversity of collection methods (hand collecting under stones, bark, etc.; sifting of litter, ferns, mosses and lichens; soil and litter washing; Berlese extractions; pitfall traps; traps baited with dung or fruits; use of different traps for flying insects: Malaise traps, flight interception traps, light traps; night collecting; sea cliff spraying; examination of bird nests) not only produced a considerable number of new species, but also allows some conclusions on the biology of different pseudoscorpion species (phoresy, halophily, sten- or euryoecy). Sea cliff spraying is an efficient method for collecting the fauna hiding in the cracks of lava-basalt cliffs in the oceanic splash zone. At low tide a short-lived pyrethrum based insecticide is sprayed into the cracks and various arthropods often come "boiling" out and fall onto the white sheet placed below (Dr S. Peck, in litt.).

Influence of collecting methods also underlines the difficulties in distinguishing between endangered, rare or common species when the ecological/biological features of a species are unknown. The presence of pseudoscorpions in insect flight traps and UV light traps indicates probable phoretic behaviour and dispersal.

Quantitative pseudoscorpion data cannot be given. It is obvious that four of the five islands with human settlements (Floreana, Isabela, San Cristobal and Santa Cruz) were more frequently sampled, having easy access to the inland areas. Access to other, smaller islands is much more difficult, possible only by boat, with one or two landing sites only; sampling in coastal habitats is therefore facilitated.

Measurements follow the indications given by Beier (1963). Terminology of trichobothria and appendices mainly follows Chamberlin (1931a), modified in some aspects by Harvey (1992) and Judson (2007). Specimens were studied in glycerine using temporary slide mounts (genital organs observed after immersion in lactic acid at 35° for a few hours or longer, if necessary, or in 10% KOH solution). After study, the specimens were returned to 75% ethanol, with the dissected portions placed in microvials. Specimens were examined with a Nikon Optiphot compound microscope (fitted with interference contrast), illustrated with the aid of a drawing tube and measured with an ocular micrometer. Measurements and proportions are given as length/breadth for the carapace and pedipalps (excepted in Chthoniidae and Lechytiidae, where pedipalpal hand and chela are given as length/depth), and as length/depth for legs I and IV. At least one specimen of each species from each island has been measured and analysed. All measurements are given in mm.

Citation of the original description and of the most recent publications settling the generic position are given in the synonymy list of each species, along with all works giving records from the Galapagos archipelago. For full references, Harvey's (2013) catalogue should be consulted. Figures are given for the new species, as well as for other species that are either newly recorded from the archipelago or for which complementary figures seem to be of interest. All specimens sent by S. Peck & coll. and I. & H. Schatz are deposited in the MHNG, those collected by W. G. Reeder are

deposited in the TNSC (e.g. 39274). The locality labels are reproduced in their original version, with a few slight modifications, when needed. The field sample codes are given in parentheses (e.g. 96-207).

TAXONOMY

CHTHONIIDAE

Tyrannochthonius albidus (Beier, 1977)

Morikawia albida Beier, 1977: 96-98, fig. 3 (type locality: Santa Cruz, "entrée de grotte dans profonde crevasse près du sommet de l'île").

Tyrannochthonius albidus (Beier): Beier, 1978: 533-534, fig. 1.

REMARKS: The type specimens (RBINS, 1 ♂ 1 ♀) have been examined and a minor correction can be added concerning the number of carapacial setae: there are 4 on the anterior border (not 2 as mentioned in the original description). No sexual dimorphism in size or proportions is evident.

This species has not been recorded since its description and it is not present in the new collections studied here. Beier (1977) classified it as "troglo- or klasiophil" and it might well inhabit the mesovoid shallow substratum (MSS).

Paraliochthonius galapagensis sp. n.

Figs 1-6

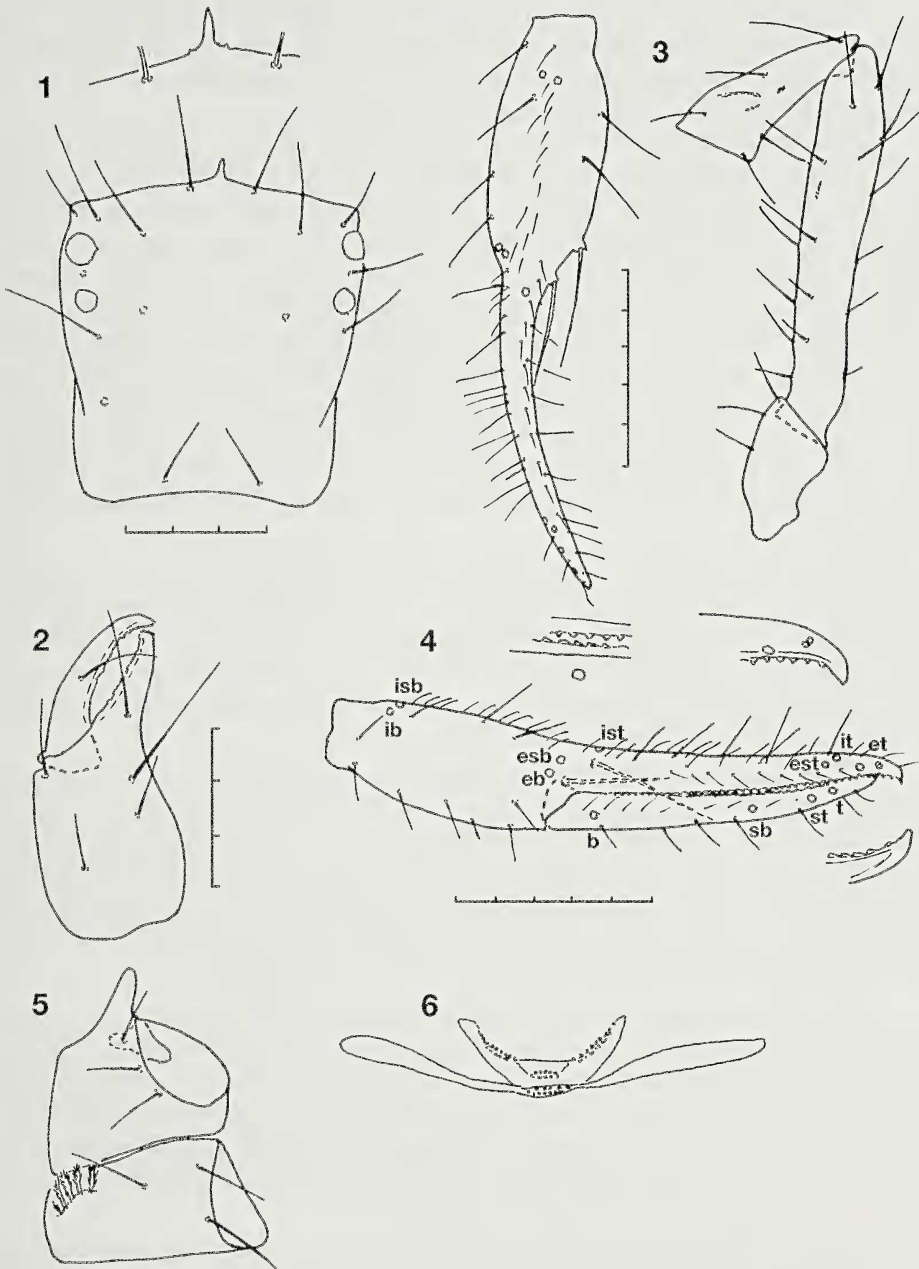
HOLOTYPE: MHNG; ♂; **Fernandina**: Cabo Hammond, sea cliff spraying, 24.V.1996, leg. S. Peck (96-207).

PARATYPES: **Fernandina**: MHNG; 1 ♀; Cabo Hammond, sea cliff spraying, 24.V.1996, leg. S. Peck (96-207).

ETYMOLOGY: The Latin epithet refers to the Galapagos archipelago.

DIAGNOSIS: The species is characterized by the presence of 4 corneate eyes and 2 spine-like setae on the paraxial margin of the pedipalpal hand; carapace with a long and narrow epistome; pedipalpal femur 6.1 (♂)/5.6 (♀) times longer than broad (length 1.02-1.03 mm), hand 2.1 times (length 0.59 mm), chela 5.3 (♂ ♀) times longer than deep (length 1.47 mm), finger 1.5-1.6 times longer than hand and curved (length of fixed finger 0.91-0.92 mm); dorsum of hand with 11-13 chemosensory setae; fixed finger with 41-44 acute teeth, movable finger with 44-45 retrorse teeth.

DESCRIPTION: Colour uniformly yellowish brown. Carapace (Fig. 1) 1.1 times longer than broad, basally narrowed, posterior margin concave, epistome long and narrow, with a few tiny teeth at its base, 4 distinct corneate eyes, posterior ones about one diameter from anterior eyes, 18 setae: 4 (plus one subocular seta on each side)-4-4-2-2; tergal chaetotaxy uniseriate: I-III 4, IV-IX 6-7, X 4, XI 4 (2 tactile setae); manducatory process acute, with 2 setae, medial seta longer than anterior one, pedipalpal coxa itself with 3 setae (1 discal), coxa I with a long, finger-like lateral corner, 3 setae, II 3 + 5-6 coxal spines in oblique row (Fig. 5), all in the distal two-thirds with incisions on both sides, III-IV 5; intercoxal tubercle absent; genital operculum with 9 (♂: 3 medial discal setae) or 10 setae (♀: 4 discal setae), male genital opening slit-like, with 6 marginal/submarginal setae on each side, 4/4 internal glandular setae, female genitalia as in Fig. 6; sternal chaetotaxy: III-IV 6, 3 suprastigmal setae on each side, V-X 10-11/10/10/9-10/9-10/7-9 (2 tactile setae). Pleural membrane pappilostriate.



FIGS 1-6

Paraliochthonius galapagensis sp. n., ♂ holotype (unless indicated otherwise). (1) Carapace, with epistome enlarged. (2) Left chelicera. (3) Right pedipalp. (4) Pedipalpal chela, lateral view. (5) Left coxae I/II. (6) Genital organ of ♀. Scale units 0.1 mm.

Chelicera (Fig. 2): 5 setae on hand and one in middle of movable finger, fixed finger with about 8 rounded (worn?) teeth, movable finger with about 8 low, rounded (worn?) teeth; no spinneret, serrula exterior with 21-22, serrula interior with 13-14 lamellae, rallum with 7-8 setae, the anterior one long and thin.

Pedipalps (Figs 3-4): trochanter 1.8 times longer than broad, femur 6.1 times (δ)/5.6 times (♀), longer than broad, slit sensillum present as in other species, patella 2.6 (δ)/2.5 (♀) times longer than broad, hand 2.1 times longer than deep, chela 5.3 times (δ ♀) longer than deep; fixed finger 1.6 (δ)/1.5(♀) times longer than hand, distinctly curved; chaetotaxy of femur 4-5-2-5, paraxial margin of hand with two spine-like setae on tubercles, both between *esb* and *ist*, dorsum of hand with 11-13 chemosensory setae between *ib/isb* and *esb*; movable finger without modified internal apodeme, finger homodontate, fixed finger with 41(δ)/44(♀) teeth, erect, acute and slightly separate, a few basal ones smaller; movable finger with 45(δ)/44(♀) teeth, 8 or so distal ones acute, others low, broad, retrorse; accessory teeth absent. Trichobothrium *ist* of fixed finger distinctly distal to *esb*, on movable finger *sb* distinctly closer to *st* than to *b*; about 4 slightly lanceolate setae near *st/t*, a single sensillum between *sb* and *st*.

Leg I: femur 5.9 (δ)/6.1(♀) times longer than deep, patella 3.4 (δ ♀) times, basitarsus 4.2(δ)/4.4(♀) times, telotarsus 10.5(δ)/9.7(♀) times longer than deep, telotarsus 1.9 (δ ♀) times longer than basitarsus; leg IV: femur+patella 3.75 (δ ♀) times, tibia 5.4(δ)/5.6(♀) times, basitarsus 2.9(δ)/3.0(♀) times, telotarsus 11.8(δ)/11.1(♀) times longer than deep, claws slender, longer than undivided arolia; tactile seta on tibia (TS=0.50), basitarsus (TS=0.23) and telotarsus (TS=0.32).

MEASUREMENTS of δ (♀ in parentheses): Total length 1.91 (2.12). Carapace 0.70/0.64 (0.74/0.68). Pedipalps: trochanter 0.35/0.19 (0.32/0.17), femur 1.03/0.17 (1.02/0.18), patella 0.52/0.20 (0.52/0.21), hand 0.59/0.28 (0.59/0.28), length of fixed finger 0.92 (0.91), of movable finger 0.86 (0.86), length of chela 1.47 (1.47). Leg I: femur 0.56/0.09 (δ ♀), patella 0.28/0.08 (δ ♀), tibia 0.30/0.07 (δ ♀), tarsus 0.58/0.06 (0.57/0.06). Leg IV: femur+patella 0.87/0.23 (0.86/0.23), tibia 0.62/0.11 (0.60/0.11), basitarsus 0.25/0.09 (0.24/0.08), telotarsus 0.63/0.05 (0.61/0.06).

REMARKS: This species can be separated from the other three members of the genus described from the Galapagos Islands as indicated in the key below. The presence of 4 distinct corneate eyes and only two spine-like setae on the paraxial margin of the hand place the new species near *P. hoestlandti* Vachon, 1960 (see Harvey, 2009). It is distinguished from the latter by its larger size (length of pedipalpal femur 1.02-1.03 mm vs. 0.83 mm, chelal length 1.47 mm vs. 1.28 mm) and higher number of teeth on fixed finger (41-44 vs. 34).

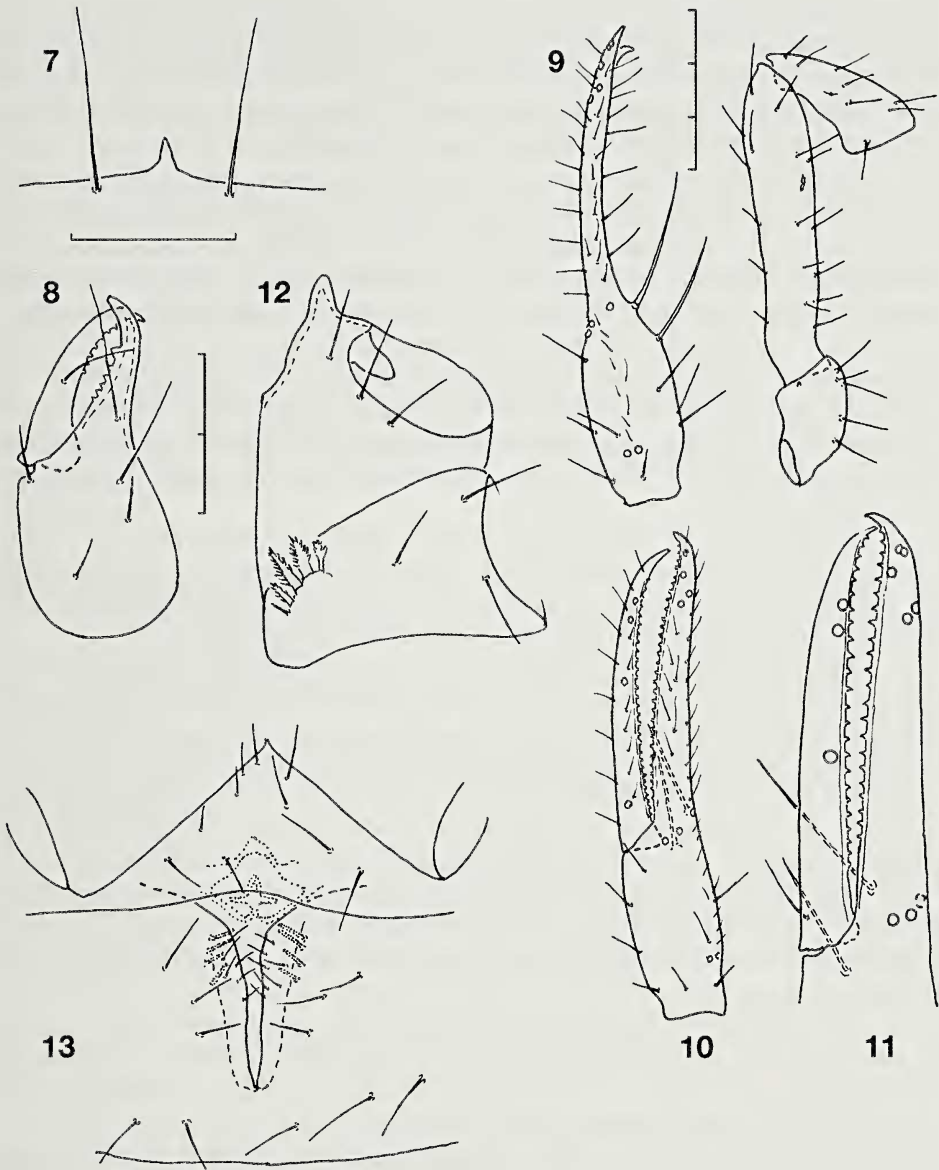
***Paraliichthonius litoralis* sp. n.**

Figs 7-13

HOLOTYPE: RBINS; δ ; **Santa Cruz**, zone de transition, 7.II.1974, leg. S. Jacquemart (76A).

PARATYPES: **Fernandina**: MHNG; 1T; Cabo Hammond, sea cliff spraying, 24.V.1996, leg. S. Peck (96-207). – **Santa Cruz**: MHNG; 1 ♀ ; Volcan Alcedo, littoral, sea cliff spraying, 1.-3.IV.1996, leg. S. Peck (96-77).

ETYMOLOGY: The name is the Latin adjective *litoralis* = of the seashore.



FIGS 7-13

Paraliochthonius litoralis sp. n., ♂ holotype (unless indicated otherwise). (7) Epistome of carapace. (8) Left chelicera. (9) Left pedipalp. (10) Pedipalpal chela, lateral view. (11) Trichobothrial pattern of tritonymph. (12) Left coxae I/II. (13) Genital region. Scale unit 0.1 mm.

DIAGNOSIS: Carapace with 4 eyes, epistome slender, triangular; pedipalps: femur 5.1 (♂)/4.6 (♀) times longer than broad and 2.0-2.1 (♀) longer than patella, patella 2.1 (♂)/2.0 (♀) times longer than broad, hand 2.0 (♂)/ 1.7 (♀) times longer than deep, fixed finger 1.84 (♂)/1.99 (♀) times longer than hand, chela 5.6 (♂)/5.0 (♀)

times longer than deep; dorsum of hand with 8-9 chemosensory setae between *ib/isb* and *esb*, paraxial margin of hand with 2 spine-like setae in distal half, one thickened seta at base (paraxial side) of movable finger; fixed finger homodontate, with 29-30 acute, upright, distinctly separate teeth, movable finger with 31-32 acute, upright, separate teeth (a few slightly retrorse teeth near fingertip).

DESCRIPTION: Colour yellowish brown. Carapace indistinctly longer than broad, basally narrowed, posterior margin concave, epistome (Fig. 7) slender and triangular, four corneate eyes present, posterior ones with flattened lens, chaetotaxy: 4 (plus one subocular seta on each side)-4-4-2-2, length of anterior medial seta 0.09 mm; tergal chaetotaxy: I-III 4, IV-V 6, VII-IX (6)-7, X 4, XI 4 (2 tactile setae); manducatory process 2, pedipalpal coxa itself 3 setae (one discal one), coxa I 3, II 3+4-5 coxal spines (Fig. 12), III/IV 5, intercoxal tubercle absent; genital operculum 10 setae (4 discal ones), male genital opening slit-like (Fig. 13), 7 marginal/submarginal setae on each side, 4+4 internal glandular setae; sternites III/IV 6 setae, 3-4 suprastigmal setae on each side, V-XI 10/10/9-10/9-11/9-11/9-10-9 (4 tactile setae). Pleural membrane papillostrate.

Chelicera (Fig. 8): 5 setae on hand, one long seta in middle of movable finger, fixed finger with 6-7 acute and separate teeth (distal one larger), movable finger with about 6-7 acute separate teeth, spinneret absent or very indistinct, serrula exterior with 19-20, serrula interior with 14 lamellae, rallum with 7(?) - 8 dentate setae.

Pedipalps (Figs 9-10): trochanter 1.8 (♂)/1.9 (♀) times longer than broad, femur 5.1 (♂)/4.6 (♀) times longer than broad, patella 2.1 (♂)/2.0 (♀) times longer than broad, hand 2.0 (♀)/1.7 (♀) times longer than deep, fixed finger 1.84 (♂)/1.99 (♀) times longer than hand, chela 5.6 (♂)/5.0 (♀) times longer than deep; chaetotaxy of femur 4-5/5/2/5, slit sensillum between 3rd and 4th seta of anterior row, dorsum of hand with 8-9 chemosensory between *ib/isb* and *esb*, paraxial margin of hand with 2 spine-like setae in distal half, one thickened seta at base (paraxial side) of movable finger; fixed finger homodontate, with 29-30 acute, upright, distinctly separate teeth, movable finger with 31-32 acute, upright, separate teeth (near finger claw a few slightly retrorse teeth), four slightly lanceolate setae near *st/t*, no modified apodeme at base of movable finger.

Leg I: femur 5.0 (♂)/4.4 (♀) times longer than deep, patella 2.7 (♂)/2.5 (♀) times longer than deep, tibia 3.6 (♂)/3.3 (♀) times, tarsus 7.4 (♂)/6.8 (♀) times longer than deep, tarsus 1.85 (♂)/1.72 (♀) times longer than tibia; leg IV: femur+patella 2.9 (♂)/2.6 (♀) times longer than deep, tibia 4.8 (♂)/4.4 (♀) times, basitarsus 2.4 (♂)/2.3 (♀) times, telotarsus 8.7 (♂)/8.2 (♀) times longer than deep; tactile setae on basitarsus (TS=0.25) and telotarsus (TS=0.32), claws slender, longer than arolia.

MEASUREMENTS of ♂ (♀ in brackets): Total length 1.38 (1.52). Carapace 0.43/0.42 (0.46/0.44). Pedipalps: trochanter 0.23/0.13 (0.21/0.11), femur 0.60/0.12 (0.54/0.12), patella 0.30/0.14 (0.26/0.13), hand 0.32/0.16 (0.27/0.16), length of fixed finger 0.59 (0.53), of movable finger 0.57 (0.51), length of chela 0.90 (0.79). Leg I: femur 0.33/0.07 (0.29/0.07), patella 0.16/0.06 (0.15/0.06), tibia 0.17/0.05 (0.16/0.05), tarsus 0.32/0.04 (0.27/0.04). Leg IV: femur+patella 0.54/0.18 (0.50/0.19), tibia 0.37/0.08 (0.34/0.08), basitarsus 0.15/0.06 (0.14/0.06), telotarsus 0.37/0.04 (0.32/0.04).

REMARKS: This new species resembles *P. johnstoni* (Chamberlin, 1923), known from Mexico, in having two spine-like setae on the distal part of the hand and similar measurements. It differs in having a different dentition on the movable chelal finger (teeth less separate and partly slightly retrorse), a more slender pedipalpal femur and by the position of trichobothrium *sb*, nearly halfway between *b* and *st*. Differences from the other species described here are given in the identification key. *Paraliochthonius vachoni* Harvey, 2009 (from New Caledonia) shows a similar size (length of chela 0.91 mm), but differs from the new species mainly in the chaetotaxy of the carapace (2 preocular setae on each side of carapace), in the mainly low retrorse teeth on the movable chelal finger and in the stouter chela (5.0 vs. 5.6 times) (female unknown).

The new species has been collected together with *P. galapagensis* sp. n. and *P. rupicola* sp. n. on Fernandina, and together with *P. pecki* sp. n. on the island of Santa Cruz. The presence of three syntopic species (96-207, leg. S. Peck) on the sea cliffs of Fernandina is surprising, even if the presence of *P. litoralis* is witnessed by one tritonymph only.

Paraliochthonius pecki sp. n.

Figs 14-17

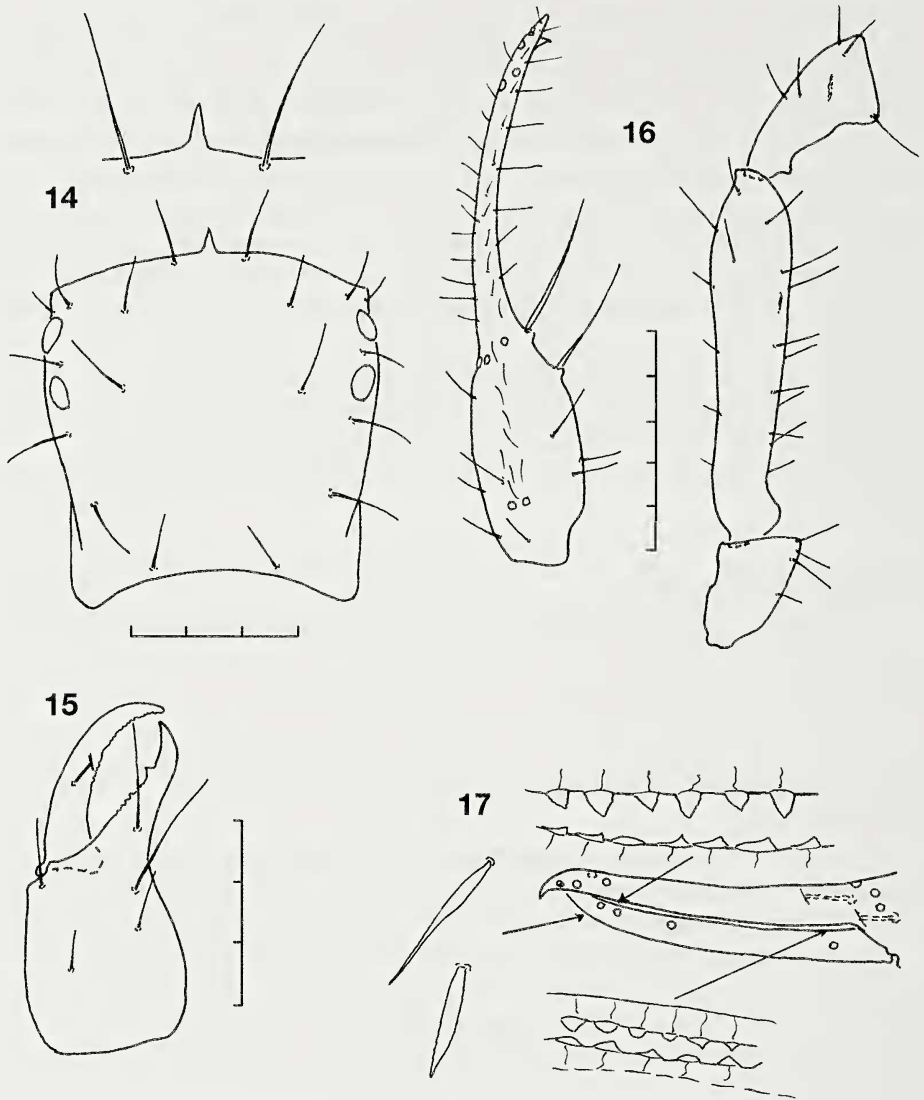
HOLOTYPE: MHNG; 1♂; **Santa Cruz**: Volcan Alcedo, littoral, sea cliff spraying, 1.-3.IV.1996, leg. S. Peck (96-77).

PARATYPES: **Santa Cruz**: MHNG; 3♂ 2♀; Volcan Alcedo, littoral, sea cliff spraying, 1.-3.IV.1996, leg. S. Peck (96-77).

ETYMOLOGY: The species is dedicated to Dr Stewart Peck, an eminent entomologist who studied the biogeography of the Galapagos archipelago for decades and collected the types.

DIAGNOSIS: Carapace with 4 corneate eyes, epistome long and triangular; pedipalps: femur 4.7-5.1 times longer than broad, patella 2.1-2.3 times longer than broad, hand 1.9-2.0 times longer than deep, fixed 1.75-1.93 times longer than hand, chela 5.4-5.7 times longer than deep; chaetotaxy of femur 5-5-2-5, dorsum of hand with 8-9 chemosensory setae, paraxial margin of hand in distal half with two spine-like setae on tubercles, movable finger with two slightly thickened setae on paraxial side, fixed finger with 33-37 acute, erect, separate teeth, movable finger with 37-42 retrorse, flattened teeth.

DESCRIPTION: Colour yellowish brown. Carapace (Fig. 14) 1.0-1.1 times longer than broad; basally narrowed, posterior margin concave, epistome long and slender, 4 corneate eyes, lens of posterior eyes flattened, chaetotaxy: 4 (plus one subocular seta on each side)-4-4-2-2, length of anterior medial seta 0.14 mm; tergal chaetotaxy: I-III 4, IV-VI 6, VII-IX (6)7, X 4, XI 4 (2 tactile setae); manducatory process 2, pedipalpal coxa itself 3 setae (1 discal one), coxa I with finger-like lateral corner, II 3 + 3/4 coxal spines, III/IV 5, intercoxal tubercle absent; genital operculum 8-11 setae (mostly 6 marginal and 4 discal setae), male genital opening slit-like, 9 marginal/submarginal setae on each side, 4/4 internal glandular setae; sternal chaetotaxy: III/IV 6, mostly 3 suprastigmal setae each, V 10, VI-IX 9-10, X 8-9 (2 tactile setae). Pleural membrane papillostriae.



FIGS 14-17

Paraliochthonius pecki sp. n., ♂ holotype. (14) Carapace. (15) Left chelicera. (16) Left pedipalp. (17) Trichobothrial pattern, with details of teeth and sensorial setae (isolated, not arranged as on finger). Scale units 0.1 mm.

Chelicera (Fig. 15): 5 setae on hand, one long seta in middle of movable finger, fixed finger with about 6 mostly acute teeth (distal one larger), movable finger with about 6-7 rounded/flattened teeth, spinneret absent, serrula exterior with 22-24, serrula interior with 14-16 lamellae, rallum with 8 dentate setae.

Pedipalps (Figs 16-17): trochanter 1.8-1.9 times, femur 4.7-5.1 times, patella 2.1-2.3 times longer than broad, hand 1.9-2.0 times longer than deep, fixed 1.75-1.93

times longer than hand, chela 5.4-5.7 times longer than deep; chaetotaxy of femur 5-5-2-5, slit sensillum between 3rd and 4th setae of anterior row, dorsum of hand with 8-9 microsetae between *ib/isb* and *esb*, paraxial margin of hand in distal half with two spine-like setae on tubercles, movable finger with two slightly thickened setae on paraxial side, no modified basal apodeme, fixed finger with 33-37 acute, erect, separate teeth (in distal half in saw-like arrangement), about 10 basal teeth somewhat smaller, movable finger with 37-42 retrorse, flattened teeth, but pointed and separate in basal third; trichobothrium *ist* distinctly distal to *esb*, *sb* of movable finger distinctly nearer to *st* than to *b* (about 2.7-3.2 times), 3-4 lanceolate setae near *t*, one single sensillum between *sb* and *st*.

Leg I: femur 5.4-5.9 times longer than deep, patella 2.90-3.2 times, basitarsus 3.9-4.6 times, telotarsus 8.7-9.3 times longer than deep; leg IV: femur+patella 2.8-3.0 times, tibia 4.9-6.0 times, basitarsus 2.4-2.8 times, telotarsus 10.2-11.3 times longer than deep; tarsi with a tactile seta each in basal third (TS=0.25-0.29 and 0.32-0.35 respectively).

MEASUREMENTS of 4♂ (2♀ in parentheses): Total length 1.90-1.91 (2.02-2.33). Carapace 0.65-0.66/0.60-0.64 (0.66-0.75/0.63-0.69). Pedipalps: trochanter 0.31-0.34/0.17-0.18 (0.37/0.19), femur 0.84-0.92/0.17-0.19 (0.88-0.96/0.18-0.19), patella 0.42-0.44/0.19-0.21 (0.42-0.48/0.19-0.23), hand 0.46-0.48/0.23-0.24, length of fixed finger 0.80-0.87 (0.87-0.95), of movable finger 0.75-0.82 (0.81-0.89), length of chela 1.26-1.34 (1.32-1.45). Leg I: femur 0.49-0.53/0.09 (0.51-0.54/0.09-0.10), patella 0.22-0.23/0.07-0.08 (0.23-0.27/0.08), tibia 0.25-0.28/0.06-0.07 (0.23-0.27/0.06-0.07), tarsus 0.46-0.51/0.05-0.06 (0.50-0.53/0.05-0.06); leg IV: femur+patella 0.79-0.84/0.26-0.29 (0.77-0.86/0.26-0.29), tibia 0.55-0.59/0.09-0.11 (0.55-0.61/0.11-0.12), basitarsus 0.20-0.23/0.08-0.09 (0.23-0.25/0.08-0.09), telotarsus 0.53-0.56/0.05 (0.56-0.60/0.05-0.06).

REMARKS: *Paraliochthonius pecki* sp. n. seems morphologically close to *P. hoestlandti*, recorded from Madeira, but differs from the latter by having a more slender chela (5.4-5.7 times vs. 4.7-5.1 times) and by the morphology (saw-like arrangement) of the teeth on the fixed chelal finger. The new species has been collected together with *Paraliochthonius litoralis* sp. n. on Santa Cruz.

Differences from the other species of the archipelago are summarized in the identification key.

Paraliochthonius rupicola sp. n.

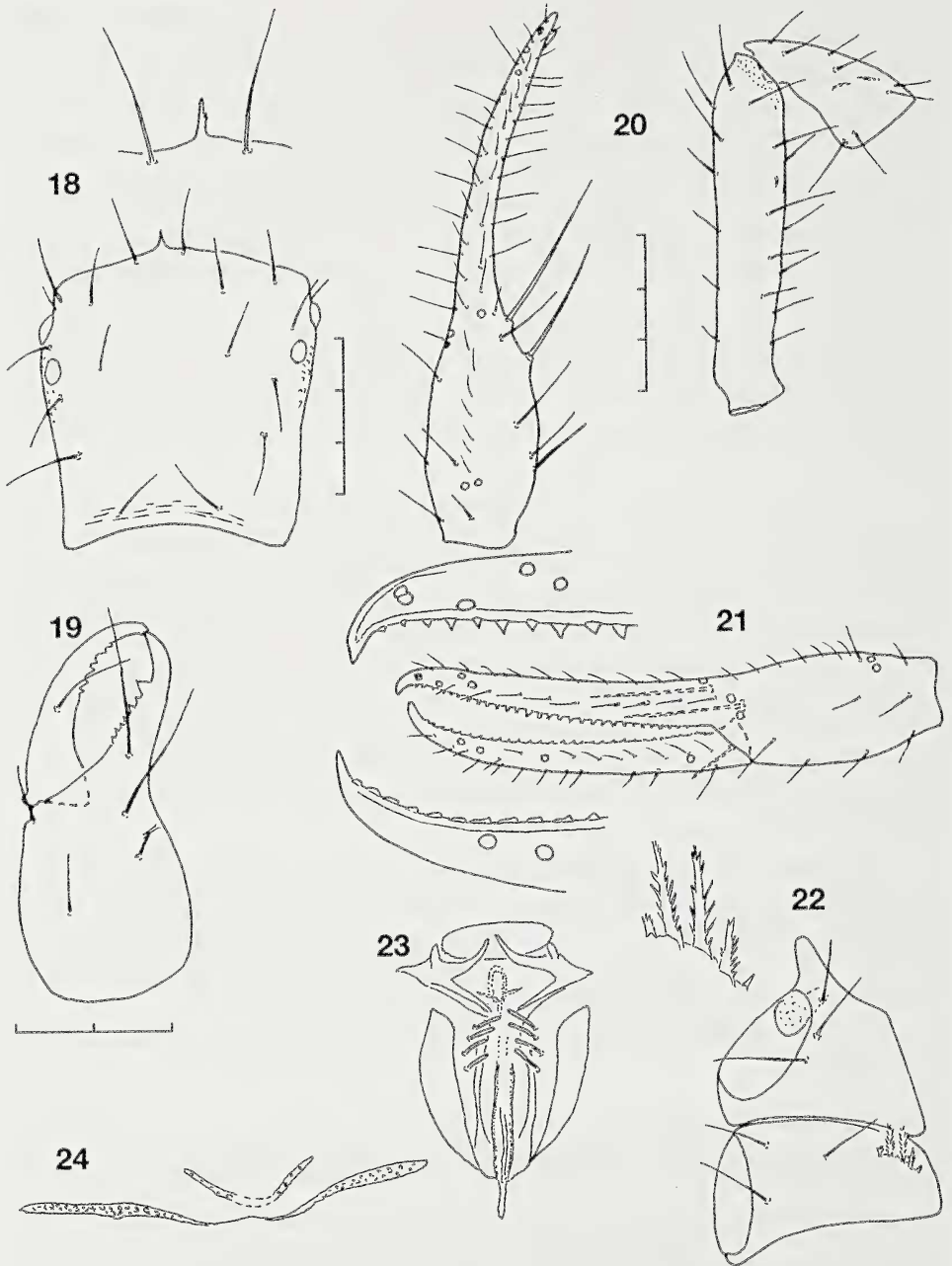
Figs 18-24

HOLOTYPE: MHNG; ♂; **Fernandina**: Cabo Hammond, sea cliff spraying, 24.V.1996, leg. S. Peck (96-207).

PARATYPES: **Isla Darwin**: MHNG; 1♂; arid zone, sea cliff spraying, 13.V.1996, leg. S. Peck (96-178). – **Fernandina**: MHNG; 1♂ 3♀; Cabo Hammond, sea cliff spraying, 24.V.1996, leg. S. Peck (96-207). – Santa Fé: MHNG; 2♂ 1♀; sea cliff spraying, 5.IV.1989, leg. S. Peck (89-182).

ETYMOLOGY: The name is a noun in apposition and refers to the habitat colonized by this species (lat. *rupes* = rock, verb *colere* = to live in, to inhabit).

DIAGNOSIS: Carapace with 4 corneate eyes, epistome long and slender; pedipalps: femur 5.0-5.2 times (♀ 4.7-5.0 times) (chaetotaxy: 5-5-2-5), patella 2.1-2.2



FIGS 18-24

Paraliocthonius rupicola sp. n., ♂ holotype (unless indicated otherwise). (18) Carapace, epistome enlarged. (19) Left chelicera. (20) Left pedipalp. (21) Pedipalpal chela, lateral view, with details of teeth. (22) Coxae I/II, coxal spines enlarged. (23) ♂ genital organ. (24) ♀ genital organ. Scale units 0.1 mm.

times (♀ 2.1 times) longer than broad, hand 1.8 times longer than deep, fixed finger 1.8-1.9 times longer than hand, chela 5.0-5.2 times longer than deep; hand with 2 long spine-like setae in medio-distal third, one slightly thickened seta in medio-basal third, movable finger with a slightly thickened seta on paraxial side near base; hand with 7-8 chemosensory setae on dorsum; fixed finger of chela with 31-35 acute erect teeth (in distal finger half with indistinctly saw-like arrangement), movable finger with 31-38 retrorse, flattened teeth.

DESCRIPTION: Colour generally light brown (carapace, pedipalps), abdominal sclerites and legs yellowish. Carapace (Fig. 18) 1.1 times longer than broad, area laterally near eyes granular, basally narrowed, posterior margin concave, with a reticulate subbasal transverse furrow; 4 corneate eyes, the posterior one flattened, epistome long and slender (partly with tiny teeth at its base), with 16 long setae (4+1 subocular seta on each side-4-4-2-2). Tergal chaetotaxy: I-III 4, IV-XI 5-7/6-6-7/6-7/7-8/7/4/4 (2 lateral tactile setae). 2 lateral setae on acute manducatory process, pedipalpal coxa itself 3 setae (1 discal), coxa I (Fig. 22) with finger-like lateral corner, 3 setae, II 3+3-5 deeply and on entire length incised coxal spines, III-IV 5, intercoxal tubercle absent; sternite II (anterior genital operculum) with 10 (11) setae (4 median discal ones), male genital opening slit-like, with 4+4 internal setae, 8-9 marginal setae, male and female genitalia as in Figs. 23-24; sternite III 8+2x3 suprastigmal setae, IV 6+2x3 suprastigmal setae, V-IX 9-10, X 8 (2 submedial tactile setae).

Chelicera (Fig. 19): 5 setae on hand, one long seta in middle of movable finger, fixed finger with 5-7 mostly acute teeth (distal one largest) (partly worn in some specimens), movable finger with about 5-7 rounded/flattened teeth, spinneret absent, serrula exterior with 20, serrula interior with about 14 lamellae, rallum with 7 dentate setae.

Pedipalps (Figs 20-21): trochanter 1.7-1.9 times, femur 5.0-5.2 times (♀ 4.7-5.0 times) (chaetotaxy: 5-5-2-5), slit sensillum as in other species, patella 2.1-2.2 times (♀ 2.1 times) longer than broad, hand 1.8 times longer than deep, fixed finger 1.8-1.9 times longer than hand, chela 5.0-5.2 times longer than deep; hand with 2 long spine-like setae in medio-distal third, one slightly thickened seta in medio-basal third, movable finger with a slightly thickened seta on paraxial side near base; hand with 7-8 chemosensory setae on dorsum; fixed finger with 31-35 acute erect teeth (in distal half with an indistinctly saw-like arrangement), movable finger with 31-38 retrorse, flattened teeth, the basal ones small and acute, basal apodeme of movable finger unmodified; about 4 lanceolate setae near trichobothrium *t*. Trichobothrium *ist* distinctly distal to *eb/esb*, *sb* on movable finger distinctly nearer to *st* than to *b*.

Leg I: femur 4.95-5.1 (♀ 4.7-5.0) longer than deep, patella 2.7-2.8 (♀ 2.7-3.0) longer than deep, tibia 3.3-3.6 (♀ 3.6-3.8) times, tarsus 7.7-8.2 (♀ 7.7-10.0) times longer than deep; leg IV: femur+patella 2.7-2.8 (♀ 2.5-2.75) times longer than deep, tibia 4.6-4.8 times (♂ ♀), basitarsus 2.3-2.4 (♀ 2.4-2.7) times, telotarsus 9.7-10.4 (♀ 9.5-10.3) times longer than deep. Tactile setae on basitarsus (TS=0.0.22-0.24) and telotarsus (TS= 0.30-0.35).

MEASUREMENTS of 5♂ (4♀ in parentheses): Total length 1.57-1.72 (1.67-2.26). Carapace 0.54-0.56/0.50-0.53 (0.56-0.65/0.53-0.60). Pedipalps: trochanter 0.28-

0.29/0.15-0.18 (0.28-0.32/0.15-0.17), femur 0.69-0.76/0.13-0.15 (0.70-0.80/0.15-0.16), patella 0.33-0.38/0.16-0.17 (0.35-0.39/0.17-0.19), hand 0.35-0.40/0.20-0.22 (0.39-0.42/0.21-0.24), length of fixed finger 0.67-0.71 (0.72-0.78), of movable finger 0.63-0.66 (0.68-0.72), chela length 1.02-1.12 (1.08-1.20). Leg I: femur 0.37-0.42/0.08 (0.41-0.44/0.08-0.09), patella 0.18-0.20/0.06-0.07 (0.19-0.22/0.07-0.08), tibia 0.18-0.23/0.06 (0.21-0.24/0.06), tarsus 0.35-0.40/0.04-0.05 (0.39-0.46/0.05); leg IV: femur+patella 0.61-0.68/0.22-0.24 (0.61-0.72/0.24-0.26), tibia 0.43-0.46/0.09-0.10 (0.45-0.50/0.10-0.11), basitarsus 0.17-0.19/0.07-0.08 (0.18-0.22/0.08), telotarsus 0.42-0.45/0.04-0.05 (0.44-0.50/0.05).

REMARKS: *Paraliochthonius rupicola* sp. n. shares with *P. mexicanus* Muchmore, 1972 the presence of three spine-like or thickened setae on the paraxial side of the hand (the basal one is distinctly weaker than the two distal ones), the presence of a slender spine-like seta at the base of the movable finger, and similar dimensions of the pedipalps, but it differs mainly by the form of the teeth on the movable chelal finger (erect in *mexicanus*, retrorse in *rupicola*) and the position of trichobothrium *sb*, which is distinctly nearer to *st* in *rupicola* sp. n. (about 2.4 times closer to *st* than to than to *sb*, vs. about 1.8 times). Comparing with species with only two spine-like setae (placed on a tubercle) on the chelal hand, the new species would belong to couplet 11 (*P. hoestlandti* from Madeira) (Harvey 2009). *P. hoestlandti* is slightly bigger (e.g. length of finger ♂ 0.72-0.82, ♀ 0.84 mm vs. ♂ 0.63-0.66, ♀ 0.68-0.72 mm), its coxal spines are dentate in the distal half (Vachon, 1960: fig. 4) vs. dentate all over the length.

The species of the genus *Paraliochthonius* apparently invaded the Galapagos archipelago at least twice, one group of species (*P. galapagensis* sp. n., *P. pecki* sp. n. and perhaps *P. rupicola* sp. n.) might be related to Atlantic species (near *hoestlandti*), a second group (*litoralis* sp. n.) might be related to species inhabiting the Pacific coast of Central America (Mexico).

The genus includes 24 species from Europe (2), the Macaronesian Islands (8), Africa (1), the Caribbean region and Mexico (6), the Galapagos archipelago (4, described here) and Australasia (3) (Harvey, 2009). The epigeal species (17) occur at or near the seashore and are evidently halophile; the seven remaining species are troglitic and restricted to caves of mainland Spain and the Macaronesian Islands (Madeira, Portugal; Canary Islands, Spain) (Harvey, 2009; Mahnert, 2011).

Pseudochthonius galapagensis Beier, 1977

Pseudochthonius galapagensis Beier, 1977: 98-99, fig. 4 (type locality: Santa Cruz, Turtle Bay, "humus dans une crevasse au pied du barranco à 1 km de la plage").

SPECIMENS EXAMINED: Gardner at Floreana: 3♂ 3♀; arid zone, litter, 2.V.1992, leg. S. Peck & J. Cook (92-148). – **Isabela**: 39274; 1♀; Sierra Negra, west slope canyon above *Scalesia* quadrat, 780 m, under compressed scoria rocks, bottom of encanada, fern, *Ipomoea*, *Zanthoxylum*, *Tournefortia*, 25.I.1978, leg. W. G. Reeder. – 1♂; Sierra Negra, 1000 m, rim crevices, fern litter, 4.III.1989, leg. S. Peck (89-101). – 1♂; Sierra Negra, 1000 m, crater rim, horse dung, 4.III.1989, leg. S. Peck (89-102). – 1♂ 3♀ 4T; Sierra Negra, 850 m, ravine, tree fern litter, 5.III.1989, leg. S. Peck (89-103). – 1T; Sierra Negra, 800 m, fern-moss litter, 13.III.1989, leg. S. Peck (89-130). – **Pinzon**: 39292; 1♀; 290 m, from finch nest of lichen built in *Croton*, 2 m above ground, *Opuntia-Croton-Pisonia* assoc., 4.II.1979, leg. W. G. Reeder. – 39289; 1♀; Old Crater Camp, 320 m, screened from litter of *Scalesia*, *Zanthoxylum*, *Acacia*, *Prosopis*, rock

outcrop NNE of camp, 5.II.1979, leg. W. G. Reeder. – 1 ♀; Central valley, upper dry zone, 290 m, under *Acacia macracantha*, *Croton scouleri*; dead grass litter and soil, 30.I.1987, leg. H. Schatz (87-569). – 1 ♂; southern crater of main caldera, *Scalesia* zone, 310 m, under *Scalesia incisa*, *Croton scouleri*, *Lantana peduncularis*, leaf litter and pieces of wood under rock, 31.I.1987, leg. H. Schatz (87-576). – 2 ♂ 1 ♀; southern crater rim of main caldera, *Scalesia* zone, 310 m, under *Scalesia incisa*, *Croton scouleri*, *Lantana peduncularis*, leaf litter and pieces of wood under rock, 31.I.1987, leg. H. Schatz (87-577). – 1D; without locality, 31.I.1987, leg. H. Schatz (87-588). – **Santa Cruz**: 39269; 1 ♂; transect from Caseta south to coast, 150 m, Quadrat E-2, 17.VIII.1970, leg. W. G. Reeder. – 1 ♀ 1T; forest near Los Gemelos, *Scalesia* zone, 600 m, *Scalesia pedunculata*, *Zanthoxylum fagara*, *Tournefortia rufo-sericea* and *Psychotria rufipes*, 8.III.1987, leg. H. & I. Schatz (87-G073). – 1 ♂ 2 ♀ 1T; 4 km SW Puerto Ayora, alt. 1 m, litter at bottom of Grieta, 1.II.1989, leg. S. Peck (89-24). – 1 ♂; CDRS, Grieta Iguana, cave litter, 13.VI.1991, leg. S. Peck (91-225). – 1 ♀; Puerto Ayora, CDRS, 2 m, Grieta Iguana, stones, 30.V.1992, leg. J. Cook & S. Peck (92-227). – **Santa Fé**: 39273; 1 ♀; rock outcrops of second barranco 1 km SSW of Camp Bay, 100 m, litter of *Cordia* and *Croton*, sheltered but very dry, 24.I.1979, leg. W. G. Reeder. – **Santiago**: 1 ♂; Playa Espumilla, littoral zone, 5 m, under *Conocarpus erecta*, decayed mangrove litter, under uppermost layer, 29.III.1988, leg. H. Schatz (88-916).

SHORT DESCRIPTION (4 ♂ 2 ♀ from Santa Cruz, Gardner at Floreana, Isabela, Pinzon, Barrington): The specimens correspond in most morphological characters with the original description; additional characters and variation in proportions and measurements are as follows. Chelicera: 5 setae on hand, serrula exterior 16, serrula interior 14 lamellae, rallum with 9 long, dentate setae. Pedipalps: femur with 18-19 setae (4-5/6/2/6), 4.9-5.8 (♂) (♀: 5.1-5.3) times, patella 2.0-2.2 (♀ 1.9) times longer than broad, hand 2.0-2.4 (♀ 2.1) times longer than deep, chela 5.7-7.4 (♀ 6.1-6.2) times longer than deep, fixed finger 1.9-2.1 (♀ 1.9-2.0) times longer than hand; fixed finger with 28-36 acute teeth (in distal two thirds alternating in length), movable finger with 25-28 teeth (in distal half acute and retrorse, then rounded and partly indistinct). Leg IV (♂ ♀): femur+patella 2.1-2.6 times longer than deep, tibia 3.8-4.6 times, basitarsus 2.9-3.4 times, telotarsus 10.3-12.9 times longer than deep, both tarsi with a basal tactile seta (TS=0.28-0.33 and 0.10 respectively).

MEASUREMENTS of 4 ♂ (2 ♀): Total length 1.10-1.21 (1.40). Carapace 0.34-0.38/0.30-0.33 (0.38-0.41/0.37). Pedipalps: femur 0.40-0.50/0.07-0.09 (0.47-0.48/0.09), patella 0.16-0.20/0.08-0.10 (0.18-0.19/0.10), hand 0.19-0.24/0.08-0.12 (0.23/0.11), length of fixed finger 0.38-0.47 (0.45), length of movable finger 0.34-0.43 (0.40-0.41), length of chela 0.57-0.72 (0.67-0.68). Leg IV: femur+patella 0.38-0.48/0.16-0.20 (0.42-0.43/0.18), tibia 0.23-0.31/0.06-0.07 (0.27/-0.28/0.07), basitarsus 0.13-0.17/0.05 (0.15-0.16/0.05), telotarsus 0.26-0.32/0.02-0.03 (0.29/0.03).

REMARKS: I could not find clear morphological differences between specimens from different islands. Variation seems to be high for some characters (e.g. proportions of hand and chela), but without a clear relation to the one or other island population.

LECHYTIIDAE

Lechytia chthoniiformis (Balzan, 1887)

Roncus chthoniiformis Balzan, 1887: unpaginated, figs. 1-3 and two unnumbered figs

Lechytia chthoniiformis (Balzan): Beier, 1977: 100 (Santa Cruz: Turtle Bay, Station Ch. Darwin).

SPECIMENS STUDIED: **Bartolomé**: 1 ♂; littoral, mangrove litter sifting, 28.III.1992, leg. S. Peck (92-63). – **Floreana**: RBINS; 2 ♀ 1T; Punta Cormoran, lagoon edge, mangrove litter,

26.III.1989, leg. S. Peck (89-158). – **Genovesa**: 1 ♀; Arcturus Lake, 20 m, littoral zone, under *Rhizophora mangle*, decayed leaf litter and black soil, 16.II.1985, leg. H. & I. Schatz (85-60). – **Isabela**: 39348; 1T; 1 km E Villamil, 5 m, screening of damp, loose litter of *Avicennia* and some *Cryptocarpus*, 5 m from standing water, 31.I.1978, leg. W. G. Reeder. – 1 ♀; 1.5 km WNW Villamil, *Ceiba* litter, 9.III.1989, leg. S. Peck (89-117). – 2 ♂ 1 ♀ 1T; 2 km W Villamil, 2 m, littoral forest litter, 2.III.1989, leg. S. Peck (89-93). – 13 ♂ 10 ♀; 2 km W Villamil, littoral zone, Buttonwood litter wash, 25.V.1992, leg. J. Cook & S. Peck (92-212). – 1D; southern part, W Puerto Villamil, littoral zone, 5 m, mangrove litter (partially decayed) and sand, 15.I.1987, leg. H. Schatz (87-513). – 1D; southern part, W Puerto Villamil, littoral zone, 5 m, in forest of *Conocarpus erecta*, well decayed mangrove leaf litter and humus, 15.I.1987, leg. H. Schatz (87-514). – **Pinzon**: 39292; 1 ♂; 290 m, from finch nest of lichen built in *Croton*, 2 m above ground, *Opuntia-Croton-Pisonia* assoc., 4.II.1979, leg. W. G. Reeder. – 1 ♂; above crater, *Scalesia* zone, 370 m, moss and lichens on rocks under ferns, 2.II.1987, leg. H. Schatz (87-595). – **Santa Cruz**: 4 ♂ 2 ♀; CDRS, 10 m, tortoise dung and hay, 7.II.1989, leg. S. Peck (89-36). – 1 ♀; CDRS, littoral zone, hightide zone, litter under mangroves, 30.I.1989, leg. S. Peck (89-1). – 1 ♀; CDRS, backbeach, under *Sesuvium* litter, 29.I.1989, leg. S. Peck (89-3). – RBINS; 1 ♂; border of the sea, 0-2 m, 9.I.1974, leg. S. Jacquemart (3). – RBINS; 11 ♂ 4 ♀ 3T; Los Gemelos, *Scalesia* zone, 570 m, 25.I.1974, leg. S. Jacquemart (39). – RBINS; 1 ♀ 1D; border of the sea, 13.II.1974, leg. S. Jacquemart (83). – 1 ♂; 2 km E Camote, Cueva Tres Entradas, 670 m, fern litter mixed with bird droppings near entrance, 29.VI.1985, leg. S. & J. Peck (85-201). – **Santiago**: 1 ♀ 11 nymphs; Playa Espumilla, littoral zone, 5 m, under *Conocarpus erecta*, decayed mangrove litter, under uppermost layer, 29.III.1988, leg. H. Schatz (88-916). – 1 ♂ 3 ♀ 3 nymphs; Playa Espumilla, SE end of lagoon, littoral zone, 5 m, under *Conocarpus erecta*, decayed mangrove litter and soil, partially with fungi, 29.III.1988, leg. H. Schatz (88-918). – **South Plazas**: 1 ♀; arid shrubs and succulent litter, 6.V.1992, leg. S. Peck (92-162).

SHORT DESCRIPTION (1 ♂ from Santa Cruz, 1 ♀ from Floreana): Carapace 18 setae (6-4-4-2-2), basally indistinctly narrowed, anterior margin medially indistinctly rounded and dentate, 2 small eyes; 1.1 times longer than broad; all tergites with 6 marginal setae except X having 4 setae; manducatory process rounded, with 2 long setae, the anterior with finely forked apex; pedipalpal coxa itself with 3 setae, coxa I 3, II 5-6, III and IV 7; intercoxal tubercle and coxal spines lacking; sternites with 8-9 marginal setae, 2 suprastigmal setae on III/IV. Chelicera with 5 setae on hand, fixed finger with 3, movable finger with 2 rounded teeth; galea short, rounded in female, an indistinct tubercle in male; serrula exterior with 14 lamellae, rallum with 8 setae. Pedipalps: femur with longitudinal groove parallel to medial face, 3.6 times (♀ 4.0 times) longer than broad, patella 1.6-1.7 times longer than broad, hand 1.7 times longer than deep and 1.4-1.5 times longer than finger, chela 3.9-4.1 times longer than deep; fixed finger with 5 tiny distal teeth, followed by about 15 indistinct teeth (or only tooth canals), movable finger with 3-4 distal small teeth followed by about 12-14 tooth canals; four trichobothria on dorsum of pedipalpal hand, trichobothria *sb/st* close to each other. Leg IV: femur+patella 2.0-2.1 times longer than deep, tibia 3.6-3.7 times, basitarsus 2.3-2.4 times, telotarsus 7.6-8.0 times longer than deep; basitarsus with long tactile seta proximal of middle (TS=0.40), telotarsus with tactile seta in basal third (TS=0.31).

MEASUREMENTS of ♂ (♀): Total length 1.0 (1.1). Carapace 0.27/0.25 (0.34/0.32). Pedipalps: trochanter 0.11/0.07 (0.12/0.08), femur 0.23/0.06 (0.29/0.07), patella 0.12/0.08 (0.15/0.09), hand 0.16/0.09 (0.18/0.11), length of finger 0.22 (0.26), length of chela 0.37 (0.44). Leg IV: femur+patella 0.24/0.13 (0.31/0.15), tibia 0.17/0.05 (0.20/0.06), basitarsus 0.09/0.04 (0.11/0.05), telotarsus 0.16/0.02 (0.19/0.03).

REMARKS: The species was already recorded by Beier (1977) from the island of Santa Cruz and has apparently settled on more or less all islands of the archipelago. The species was described from Paraguay and the Argentinian Chaco, and was subsequently recorded from several South American countries (Mahnert *et al.*, 2011). It is frequently found in leaf litter, but also under the bark of fallen dead trunks and in humus.

SYARINIDAE

Ideoblothrus emigrans sp. n.

Figs 25-29

Ideobisium simile (not Balzan, 1892): Beier, 1977: 100-101 - misidentification.

HOLOTYPE: RBINS; ♀; **Floreana**: Punta Cormoran, lagoon edge, mangrove litter, 26.III.1989, leg. S. Peck (89-158).

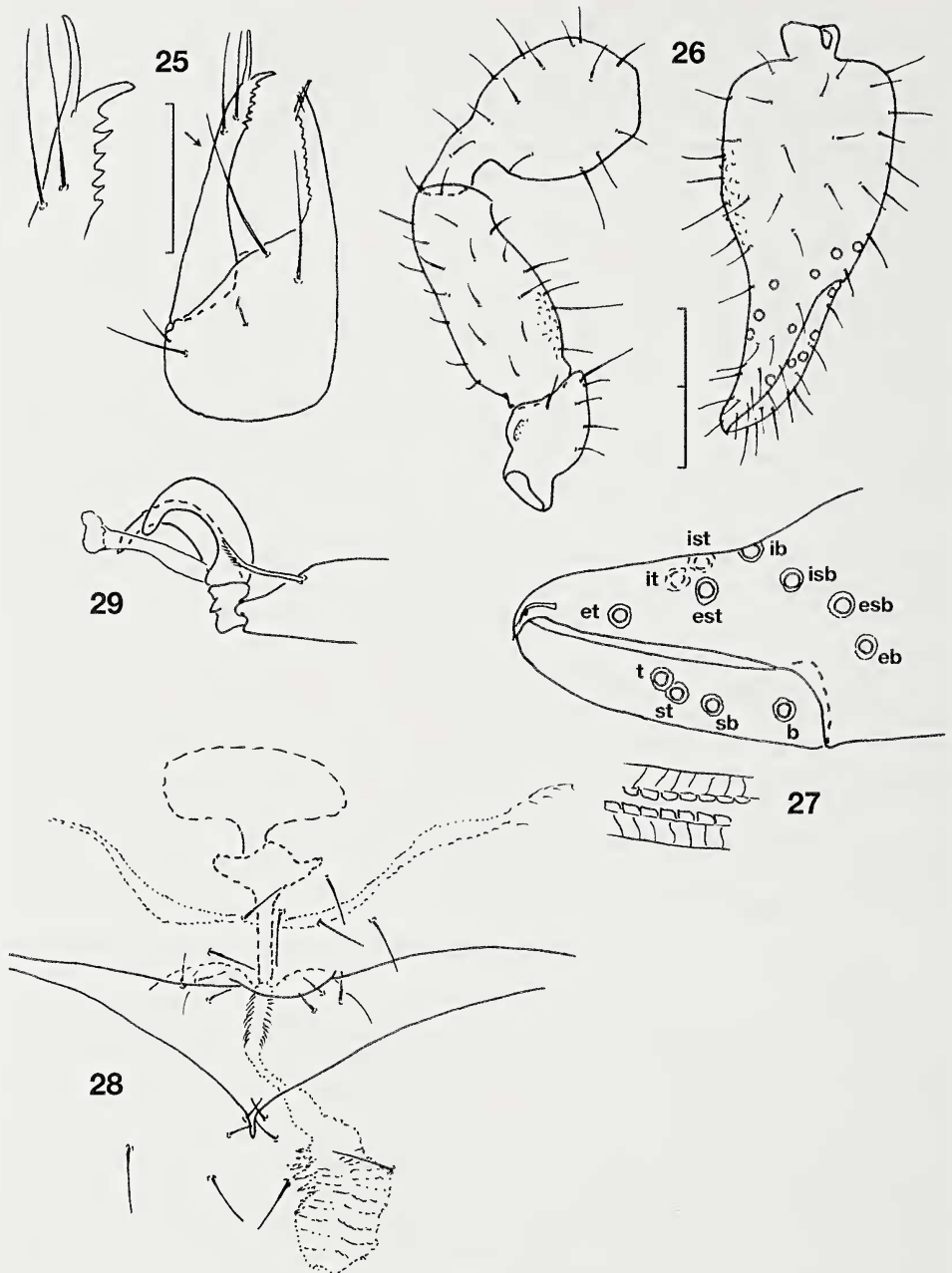
PARATYPES: **Floreana**: 1♂; Punta Cormoran, lagoon edge, mangrove litter, 26.III.1989, leg. S. Peck (89-158). – **Pinzon**: 1T; eastern part, Lower Dry zone, 100 m, under *Croton scouleri* and *Cordia lutea*, partially decayed leaf litter, 31.I.1987, leg. H. Schatz (87-584). – 1♂ 2T; passage to southern slope, beside big rock, Fern Sedge zone, 340 m, *Croton scouleri*, *Alternanthera echinoccephala*, under *Cordia leucophlyctis*; decayed leaf litter and black soil, 3.II.1987, leg. H. Schatz (87-603). – **Santa Cruz**: RBINS; 8♂ 6♀, MHNG; 4♂ 9♀; CDRS, border of the sea, *Sesuvium*, 9.I.1974, leg. S. Jacquemart (1). – RBINS; 1♀; CDRS, meteorological station, 9.I.1974, leg. S. Jacquemart (2). – RBINS; 3D; *Scalesia* zone, 11.II.1974, leg. S. Jacquemart (80A). – 1♀ 1T 1D; Academy Bay, CDRS, litter at bottom of Grieta Iguana, 29.V.1985, leg. S. & J. Peck (85-178). – 2♂ 1♀ 1T; CDRS, Grieta Iguana, cave litter, 13.VI.1991, leg. S. Peck (91-225). – 2♀ 3T; CDRS, Cueva Iguana, arid zone, 1 m, litter at pool, 4.V.1996, leg. S. Peck (96-153). – 1♀; CDRS, 1 km E, lagoon, 0 m, litter of *Sesuvium*, 5.IV.1996, leg. S. Peck (96-156). – 6♂ 3♀; CDRS, 0 m, mangrove litter, 6.V.1996, leg. S. Peck (96-167). – 1♀; between coast and Tortoise reserve, under rocks, 26.II.1985, leg. H. & I. Schatz (85-H19). – NHMW 22347: 11 adults & 3 nymphs; Turtle Bay, humus dans une crevasse au pied du barranco, 1 km de la plage, II.1965, leg. J. & N. Leleup (det. M. Beier as *Ideobisium simile*).

OTHER SPECIMENS: RBINS I.G.24965; 1♀; Galapagos, without locality, 1973/74, leg. S. Jacquemart. – **Rabida**: 39371; 1♀; screening of dry litter of *Avicennia-Cryptocarpus* on beach berm margin and behind lagoon, 28.IX.1975, leg. W. G. Reeder. – **Santa Cruz**: 39281; 1T; transect from Caseta south to coast, 130 m, Quadrat A, 1.-18.VIII.19870, leg. W. G. Reeder.

ETYMOLOGY: The epithet is the present participle of the Latin verb *emigrare* (= to emigrate).

DIAGNOSIS: Carapace with a broad, indistinct, median transverse furrow, anterior border with a small rounded epistome, no eyes; 26-27 setae; cheliceral rallum with 6 setae, the proximal one distinctly shorter; femur 2.4 times (length less than 0.41 mm), patella 1.8 times, club 1.2-1.3 times, hand with pedicel 1.4 (♂)/1.5 (♀) times, chela with pedicel 2.6 (♂)/2.5 (♀) times, without pedicel 2.4 (♂)/2.3 (♀) times longer than broad, movable finger 1.1 (♂)/1.2 (♀) times longer than hand with pedicel and 1.3 (♂)/1.2 (♀) times longer than hand breadth; fixed finger with 18-19 small teeth, movable finger with 26-27 marginal teeth; trichobothrium *ib* distal to *isb*, *ist* and *est* at same level, *it* in proximal half of finger, *st* close to *t* (areoles touching).

DESCRIPTION (♂ ♀ from Floreana): Pedipalpal femur and patella reddish brown, hand indistinctly darker, carapace reddish brown, lighter in basal half, tergites undivided, I and II whitish, the following ones brownish. Carapace with a broad, indistinct, median transverse furrow, anterior border with a small, rounded epistome, no eyes; 26-27 setae (4/6/6/6/5-6), 1.3 times longer than broad. Chaetotaxy of tergites



FIGS 25-29

Ideoblothrus emigrans sp. n., ♂ holotype. (25) Left chelicera, with enlarged distal end of movable finger. (26) Left pedipalp. (27) Trichobothrial pattern, with details on marginal teeth. (28) Sternites II/III, with genital structures. (29) Distal end of tarsus IV, subterminal seta and claws. Scale units 0.1 mm.

(setae of alternating length): I 7, II 7-9, III-IX 9, X 7 (2 lateral, 2 submedial tactile setae), XI 7 (4 tactile setae). Manducatory process with 2 setae, pedipalpal coxa itself with 5-6 setae, coxa I 4-5, II 5, III 4-5, IV 5; anterior genital operculum (sternite II) with 4 medial marginal setae in female, in male with a short, plate-like central prolongation, 6 setae (2 discal ones) (δ), male genital opening with 3+3 internal smooth setae, median genital sac undivided and enlarged, lateral sacs normal (Fig. 28); sternal chaetotaxy: III 4-6 marginal setae + 2 suprastigmal setae on each side plus (δ only) 2 pairs of short discal setae behind medial notch of anterior margin, IV 7-8+2x2, V 10, VI-VIII 11, IX 9-11, X 8-9, XI 3-5 (2 submedial tactile setae). Pleural membranes striate, but anterior to segment I papillostriate.

Chelicera (Fig. 25): 5 long smooth setae on hand, fixed finger with 9-13 small marginal teeth, movable finger with 6-7 erect teeth; galea long, curved (♀) or spine-like, short, reaching barely beyond claw of movable finger (δ), subgaleal seta reaching distinctly beyond tip of galea (subgaleal seta doubled on left chelicera of holotype!), serrula exterior with 20-22, serrula interior with about 18 lamellae; rallum with 6 setae, distal 5 finely dentate on anterior border, the proximal one distinctly shorter.

Pedipalps (Figs 26-27): trochanter with a knob-like dorsal protuberance, femur granular in medio-basal part, patella smooth, hand finely granular on medial side; trochanter 1.9 times longer than broad, femur 2.4 times, patella 1.8 times, club 1.2-1.3 times, hand with pedicel 1.4 (δ)/1.5 (♀) times, chela with pedicel 2.6 (δ)/2.5 (♀) times, without pedicel 2.4 (δ)/2.3 (♀) times longer than broad, movable finger 1.1 (δ)/1.2 (♀) times longer than hand with pedicel and 1.3 (δ)/1.2 (♀) times longer than hand breadth; fixed finger with 18-19 small teeth (7 distal ones with retrorse cusp), movable finger with 26-27 (about 7 distal ones with anterior cusp) marginal teeth; venom duct very short, present in fixed finger; trichobothrial pattern (Fig. 27): *ib* distal to *isb*, *ist* and *est* at same level, *it* in proximal half of finger, *st* close to *t* (areoles touching), distal half of *t* distinctly lanceolate.

Leg I: femur 1.5-1.7 times longer than deep and 1.1 times longer than patella, patella 1.5-1.6 times, tibia 3.6-3.7 times, basitarsus 1.8-2.0 times, telotarsus 4.1-4.3 times longer than deep, telotarsus 1.8 times longer than basitarsus. Leg IV: femur+patella 2.6-2.8 times, tibia 3.6-3.9 times, with a tactile seta distal of middle (TS= 0.61), basitarsus 1.7-1.9 times, with a basal tactile seta (TS= 0.25), telotarsus 2.9-3.6 times longer than deep, telotarsus 1.6-1.7 times longer than basitarsus; arolia undivided, longer than smooth claws; subterminal seta dentate (Fig. 29).

MEASUREMENTS of holotype (paratype) from Floreana: Total length 1.45 (1.59). Carapace 0.39/0.29 (0.38/0.31). Pedipalps: femur 0.29/0.12 (0.27/0.15), patella 0.28/0.16 (0.27/0.15), length of pedicel 0.08 (0.08), hand with pedicel 0.29/0.20 (0.27/0.19), length of pedicel 0.04 (0.04), length of movable finger 0.24 (0.24), length of chela with pedicel 0.51 (0.48). Leg I: femur 0.12/0.07 (0.11/0.07), patella 0.11/0.07 (0.10/0.07), tibia 0.14/0.04 (0.15/0.04), basitarsus 0.06/0.03 (0.06/0.03), telotarsus 0.11/0.02 (0.11/0.03); leg IV: femur+patella 0.27/0.10 (0.26/0.10), tibia 0.21/0.05 (0.20/0.06), basitarsus 0.07/0.04 (0.07/0.04), telotarsus 0.11/0.04 (0.12/0.03).

DESCRIPTION of 3 δ 6 ♀ from Santa Cruz and 1 δ from Pinzon indicating some variability for the following characters: carapace with 27-30 setae (6 on anterior, 5-7

on posterior margin); sternites with up to 13 marginal setae. Chelicera: serrula exterior 22-26, serrula interior 18-22 lamellae, rallum with 6 (1 ♂: 7) setae. Pedipalps of ♂ (♀): trochanter 1.8-1.9 (1.7-1.8) times, femur 2.5 (2.5-2.6) times, patella 1.9-2.0 (1.9-2.0) times, hand with pedicel 1.3-1.4 (1.3-1.4) times, chela with pedicel 2.3-2.4 (2.3-2.6) times longer than broad, hand with pedicel 1.0-1.2 (1.1-1.2) times longer than movable finger, movable finger 1.2-1.3 (1.2-1.3) times longer than hand breadth; fixed finger with 22-28 (23-29) teeth, movable finger with 29-33 (28-35) teeth. Leg I: femur 1.7-1.8 (1.6-1.8) times longer than deep and 0.96-1.15 (1.0-1.2) times longer than patella, patella 1.5-2.0 (1.5-1.8) times, tibia 4.0-4.5 (4.1-4.6) times, basitarsus 2.3-2.7 (2.3-2.5) times, telotarsus 4.3-5.0 (4.2-5.2) times longer than deep and 1.5-1.6 (1.5-1.7) times longer than basitarsus; leg IV: femur+patella 2.6-2.9 (2.8-3.0) times, tibia 3.6-4.2 (4.1-4.3) times, basitarsus 1.7-2.0 (1.8-2.1) times, telotarsus 3.4-4.1 (4.0-4.2) times longer than deep and 1.7 (1.6-1.7) times longer than basitarsus.

MEASUREMENTS of ♂ (♀): Pedipalps: femur 0.32-0.39/0.13-0.16 (0.31-0.41/0.13-0.16), patella 0.32-0.40/0.17-0.20 (0.30-0.41/0.15-0.22), hand with pedicel 0.31-0.37/0.23-0.28 (0.29-0.42/0.21-0.31), length of movable finger 0.27-0.33 (0.27-0.33), length of chela with pedicel 0.54-0.66 (0.53-0.71). Leg I: femur 0.13-0.15/0.07-0.09 (0.11-0.15/0.07-0.09), patella 0.12-0.16/0.07-0.08 (0.12-0.15/0.07-0.08), tibia 0.18-0.22/0.04-0.05 (0.17-0.22/0.04-0.05), basitarsus 0.08-0.09/0.03 (0.07-0.08/0.03), telotarsus 0.12-0.14/0.03 (0.11-0.14/0.03); leg IV: femur+patella 0.31-0.38/0.11-0.13 (0.30-0.38/0.10-0.13), tibia 0.25-0.29/0.06-0.07 (0.23-0.30/0.06-0.07), basitarsus 0.08-0.09/0.04-0.05 (0.08-0.09/0.04-0.05), telotarsus 0.13-0.16/0.04 (0.13-0.16/0.03-0.05).

REMARKS: The new species belongs to a group of small species (length of pedipalpal femur less than 0.42 mm, length of chela with pedicel less than 0.72 mm) with a short proximal seta of the rallum. It is similar to *I. amazonicus* (Mahnert, 1979) and *I. brasiliensis* (Mahnert, 1979) (Brazil, Amazonia), *I. truncatus* (Hoff, 1964) (Jamaica) and *I. curazavius* (Wagenaar-Hummelincx, 1948) (Curaçao). It differs from *I. amazonicus* by the trichobothrial pattern (*ib* distinctly distal to *isb* vs. nearly at same level; *est-ist-it* in proximal half of fixed finger vs. in distal half of finger), and by the higher number of setae on carapace (26-28 vs. 22-23). It differs from *I. brasiliensis* by the position of *ib* distal to *isb* (vs. at same level) and by a stouter chela (with pedicel 2.3-2.5 times vs. 2.7-3.0 times longer than broad). *Ideoblothrus truncatus* bears only 22-24 setae on its carapace and a higher number of teeth on the movable chelal finger (41-42 vs. 26-35). The (few) largest specimens of *I. emigrans* sp. n., with a femur length of 0.39-0.41 mm (mean of 10 specimens 0.36 mm) and a chela length with pedicel of 0.66 or 0.71 mm (mean of 10 specimens 0.61 mm), approach the values of *I. curazavius* from Curaçao, but the latter is still larger (length of femur 0.42-0.47 mm, mean of 7 specimens 0.44 mm; length of chela with pedicel 0.67-0.73 mm, mean of 7 specimens 0.70 mm) and its pedipalpal patella is indistinctly granular (smooth in *I. emigrans* sp. n.). *Ideoblothrus curazavius* shares with the new species the distal position of trichobothrium *ib* which is distinctly distal to *isb*.

Specimens from Santa Cruz, Pinzon and Rabida seem to be slightly larger than the two specimens from Floreana, but they do not differ in other characters such as chaetotaxy and the proportions of the pedipalps and legs. A similar size difference

between populations was also observed in *I. brasiliensis* from Santarém and Belém (Mahnert, 1979). Variation in size seems to be higher in specimens from Santa Cruz than in those from Floreana, but this might just be due to the higher number of examined specimens from Santa Cruz.

Most of the specimens were collected in litter at the coast (mangrove litter on Floreana, litter of *Sesuvium* at the lagoon, 0 m altitude, litter of Grieta Iguana, 1 m alt., on Santa Cruz and Rabida), only a very few were found in litter at altitudes of 100 m to 340 m (Pinzon, Santa Cruz).

The record of specimens from Galapagos Islands under *Ideobisium simile* Balzan by Beier (1977) (NHMW 22347) is based on a misidentification. Muchmore (1982) clarified the status of *Ideoblothrus* Balzan, 1892 and *Ideobisium* Balzan, 1892 and established the true identity of *Ideobisium simile*.

Ideoblothrus galapagensis sp. n.

Figs 30-34

HOLOTYPE: MHNG; ♂; Gardner at Floreana: arid zone, litter, 2.V.1992, leg. S. Peck & J. Cook (92-148).

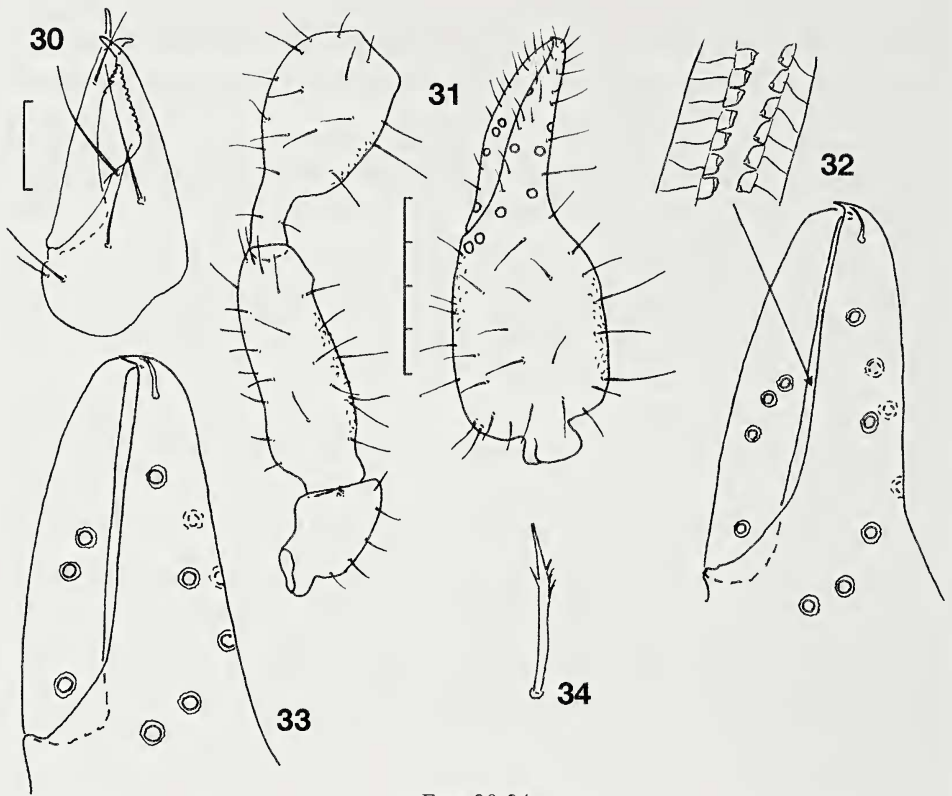
PARATYPES: Gardner at Floreana: MHNG; 1♂ 4T; arid zone, litter, 2.V.1992, leg. S. Peck & J. Cook (92-148).

DIAGNOSIS: Chelicera with rallum of 6 setae, all finely dentate on anterior border, the proximal one distinctly shorter than the others; pedipalps: femur 2.9-3.0 times (length 0.58-0.59 mm), patella 2.1-2.2 times, club 1.4-1.5 times, hand with pedicel 1.6 times, chela with pedicel 2.9 times, without pedicel 2.7 times longer than broad, movable finger 1.1-1.2 times longer than hand with pedicel and 1.4 times longer than hand breadth; fixed finger with 37-38 small cusped teeth, movable finger with 45-47 cusped teeth; trichobothria *ist* and *est* at same level, *st* nearer to *t* (areoles not touching) than to *sb*.

ETYMOLOGY: The species name refers to the Galapagos islands.

DESCRIPTION OF ADULTS: Pedipalps and carapace reddish brown, latter lightened in basal part, tergites undivided, brown, I and II narrower. Carapace with a broad, distinct, median transverse furrow, anterior border with a small, rounded epistome; no eyes; 26 setae (4-6-4-6-6). Chaetotaxy of tergites (setae of alternating length): I 6-7, II-V 9, VI-VII 9-10, VIII-IX 9, X 7(2 lateral, 2 submedial tactile setae), XI 7 (4 tactile setae). Manducatory process with 2 setae, pedipalpal coxa itself with 6-8 setae, coxa I 5-7, II 5, III 4-5, IV 5-6; anterior genital operculum (sternite II) with 6-7 setae, genital opening with 3+3 internal setae; sternal chaetotaxy: III 6-8 marginal setae plus 2 suprastigmal setae on each side plus 2 pairs of short discal setae behind medial notch of anterior margin, IV 9-10+2x2, V-XI 12-13/12-13/11-13/11-12/11/10-11/6 (4 tactile setae).

Chelicera (Fig. 30): 5 long setae on hand, fixed finger with 10 small teeth, movable finger with 6-7 retrorse teeth; galea spine-like, short, barely extending beyond tip of movable finger (except on left chelicera of holotype, where it is long and slightly curved, thus resembling the galea in females of other species!), subgaleal seta distinctly reaching beyond tip of galea, serrula exterior with 28, serrula interior with 23 lamellae; rallum with 6 setae, all finely dentate on anterior border, the proximal one distinctly shorter than others. Pleural membranes striate, anterior to segment I papillo-striate.



FIGS 30-34

Ideoblothrus galapagensis sp. n., ♂ holotype (unless indicated otherwise). (30) Right chelicera. (31) Left pedipalp. (32) Trichobothrial pattern, marginal teeth enlarged. (33) Trichobothrial pattern of tritonymph. (34) Subterminal seta of tarsus IV. Scale units 0.1 mm.

Pedipalps (Figs 31-32): femur finely granular in medio-basal part, patella finely granular on medial side, hand finely granular on paraxial side and indistinctly so on anti-axial side; trochanter 1.8 times longer than broad, femur 2.9-3.0 times, patella 2.1-2.2 times, club 1.4-1.5 times, hand with pedicel 1.6 times, chela with pedicel 2.9 times, without pedicel 2.7 times longer than broad, movable finger 1.1-1.2 times longer than hand with pedicel and 1.4 times longer than hand breadth; fixed finger with 37-38 small cusped teeth, movable finger with 45-47 cusped teeth and 1 weakly developed venedens receptor; venom duct very short, present in fixed finger; trichobothrial pattern (Fig. 32): *ist* and *est* at same level, *st* nearer to *t* (areoles not touching) than to *sb*, distal half of *t* distinctly lanceolate.

Leg I: femur 2.2 times, patella 1.8-2.1 times longer than deep, femur 1.1-1.3 times longer than patella, tibia 4.8-5.0 times, basitarsus 2.3-2.5 times, telotarsus 4.9-5.7 times longer than deep, telotarsus 1.6-1.7 times longer than basitarsus; leg IV: femur+patella 2.8-2.9 times, tibia 4.9-5.1 times, basitarsus 1.9-2.0 times, telotarsus 4.4-4.9 times longer than deep, telotarsus 1.6-1.7 times longer than basitarsus; tibia with one tactile seta near middle, basi- and telotarsus with one basal tactile seta each; arolia undivided, longer than smooth claws, subterminal seta finely dentate (Fig. 34).

MEASUREMENTS of holotype ♂ (paratype ♂): Total length 2.63 (2.42). Carapace 0.69/0.55 (0.61/0.53). Pedipalps: trochanter 0.32/0.17 (0.32/0.18), femur 0.58/0.20 (0.59/0.20), patella 0.56/0.26 (0.55/0.26), length of pedicel 0.18 (0.19), hand with pedicel 0.54/0.33 (0.53/0.32), length of pedicel 0.07 (0.07), length of movable finger 0.48 (0.45), length of chela with pedicel 0.97 (0.94). Leg I: femur 0.24/0.11 (0.23/0.11), patella 0.22/0.11 (0.18/0.10), tibia 0.31/0.06 (0.29/0.06), basitarsus 0.12/0.05 (0.11/0.05), telotarsus 0.19/0.04 (0.19/0.03); leg IV: femur+patella 0.55/0.19 (0.55/0.19), tibia 0.44/0.09 (0.44/0.09), basitarsus 0.14/0.07 (0.14/0.07), telotarsus 0.22/0.05 (0.23/0.05).

DESCRIPTION OF TRITONYMPH (1 specimen) (Fig. 33): Carapace with indistinct transverse furrow, epistome small, rounded, 26-27 setae (6-7 on posterior border), 1.1 times longer than broad (0.50 mm/0.47 mm), tergal chaetotaxy: tergite I 6, II-IX 8-9, X-XI 7 (4 tactile setae); manducatory process 2 setae, pedipalpal coxa itself with 6 setae, coxa I-IV 4; sternal chaetotaxy: III 4+2x2 setae, IV 8+2/3, V-X 10-11, XI 6 (4 tactile setae). Chelicera with 5 setae on hand, fixed finger with 11, movable finger with 6 small teeth, serrula exterior 22 lamellae, rallum 5 setae (proximal one shorter), galea long and curved, reaching tip of galea. Pedipalps: femur, patella and hand indistinctly granular, trochanter 1.8 times longer than broad (0.24 mm/0.13 mm), femur 2.6 times (0.40/0.16), patella 2.0 times (0.38/0.19), length of pedicel 0.12 mm, hand with pedicel 1.4 times (0.37/0.26), chela with pedicel 2.6 times, without pedicel 2.5 times longer than broad, length of movable finger 0.34 mm, of chela with pedicel 0.68 mm. Leg IV (length/depth): femur+patella 2.7 times (0.41/0.15), tibia 3.9 times (0.30/0.08), basitarsus 1.7 times (0.10/0.06), telotarsus 3.5 times (0.16/0.05) longer than deep.

REMARKS: The new species differs by its larger size from *I. curazavius* (Curaçao), *I. colombiae* Muchmore, 1982 (Colombia, Magdalena) and *I. caecus* (Mahnert, 1979) (Brazil, Amazonia) (length of femur 0.58-0.59 mm vs. 0.42-0.48 mm, length of chela 0.94-0.97 mm vs. 0.76-0.87 mm). It shares with *I. maya* (Chamberlin, 1938) similar pedipalp measurements and proportions (e.g. femur ratio 2.9-3.0 vs. 2.75, length 0.58-0.59 mm vs. 0.56, chela ratio 2.9 vs. 2.7, chela length 0.94-0.97 mm vs. 1.03 mm), but it differs in the trichobothrial pattern (*st* close to *t* in *galapagensis* sp. n. vs. *sb-st-t* equidistant in *maya*; *it* distinctly distal to *ist-est* which are nearly at same level in *galapagensis* sp. n. vs. *it-ist* distinctly distal to *est* in *maya*); furthermore, the number of teeth on fixed/movable chelal fingers seems to be higher in *maya* than in *galapagensis* sp. n. (46/58 vs. 37-38/45-47). *Ideoblothrus maya* is known only from a cave in Yucatan (Mexico).

Muchmore (1972) emphasized the structure of the rallum as a taxonomic character useful to indicate affinities between species of the genus *Pachychitra* Chamberlin, 1938, a genus that he later relegated to the synonymy of *Ideoblothrus* Balzan, 1892 (Muchmore, 1982). Subsequent observations seem to corroborate the value of this character (Harvey & Edward, 2007), even if accurate observation of number of setae and their structure can be problematic: Wagenaar-Hummelinck (1948) observed "setae of equal length" on the type specimen of *I. maya*, whereas Muchmore (1972) indicates for this species (source of information not stated) in his key "proximal seta of cheliceral flagellum distinctly shorter than the others". Chamberlin (1938) indicated the number of setae in the rallum, but not their lengths.

OLPIIDAE

Aphelolpium cayanum Muchmore, 1979

Aphelolpium cayanum Muchmore, 1979: 201-203, figs 12-20 (type locality: Florida, Marathon, Vaca Key, Monroe County).

SPECIMENS STUDIED: **Espanola:** 39312; 1♂; Punta Cevallos area, 30 m, screening of *Prosopis* litter, *Prosopis-Lantana*, single *Bursera*, 11.II.1977, leg. W. G. Reeder. – **Floreana:** RBINS/MHNG; 2♂ 1♀; Black Beach, *Cryptocarpus* litter, 24.III.1989, leg. S. Peck (89-149). – 1♀; 1 km S Black Beach, crevice, litter supralittoral, leg. S. Peck (89-157). – 1♀; peninsula south of Black Beach, littoral zone, 5 m, under *Cryptocarpus pyriformis*, leaf litter in crevice, 21.I.1987, leg. H. Schatz (87-550). – **Gardner** at Espanola: 39323; 2♀; 20 m, litter of large *Opuntia*, *Bursera-Croton-Cordia* community, 13.II.1977, leg. W. G. Reeder. – **Isabela:** 2♂ 1♀; Sierra Negra, 800 m, fern-moss litter, 13.III.1989, leg. S. Peck (89-130). – 1♀; Volcan Darwin, Upper Dry (*Psychotria*) zone, 1300 m, shrub layer (80% coverage) dominated by *Scaevola* sp., *Dodonaea viscosa*, furthermore a few *Zanthoxylum fagara*, *Macraea loricifolia* and *Opuntia insularis*, partially decayed leaf litter, pieces of wood and soil (lava); 28.III.1988, leg. L. Baert, K. Desender & J.-P. Maelfait (loc. 90), don. H. Schatz (88-962). – **San Cristobal:** 1♂; Baquerizo, beach, 2 km N, littoral zone, litter under succulents, 11.II. 1989, leg. S. Peck (89-46). – MHNG/RBINS; 4♂ 1♀ 1T; Baquerizo, 10 m, arid zone FIT, 11.-23.II.1989, leg. S. Peck.

SHORT DESCRIPTION (4♂ 3♀): The specimens correspond well with the original description of the species from Florida Keys, USA. Carapace with 28-34 setae, 6 on anterior and 4 on posterior margin, mostly 2 thin preocular setae on each side; 1.3-1.6 times (♂) (♀ 1.2-1.45) longer than broad. Tergite I with 4 setae, II 4 (1♂ 5), III-VIII mostly with 5-6, but up to 8, IX-XI 8-10, those setae finely dentate/forked. Sternites III/IV: tracheal trunks not dilated. Chelicera: serrula exterior 16-18 lamellae, rallum with 2 unequal, dentate blades. Pedipalps smooth, except for some tiny granules on median face of patella, femur 4.0-4.5 times longer than broad, one tactile seta in basal third (TS=0.23-0.26), patella 3.0-3.3 times, hand cordiform, with pedicel 1.3-1.5 (♂) (♀ 1.2-1.3) times, chela with pedicel 3.4-3.6 (♂) (♀ 3.0-3.2) times longer than broad, finger 1.4-1.6 times longer than hand with pedicel, not gaping; fixed finger with 27-31 broad, retrorse teeth, movable finger with 17-22 teeth (distal 7-9 acute, others broad and flattened); lanceolate setae present on fixed finger; a row of about 8 lanceolate setae on movable finger near trichobothrium *t*. Leg I: femur 3.4-3.6 times longer than deep and 2.0-2.2 times longer than patella, patella 1.7-2.0 times longer than deep, tibia 3.7-4.4 times, basitarsus 4.1-4.5 times, telotarsus 4.4-5.7 times longer than deep, basitarsus 1.2-1.5 times longer than telotarsus; leg IV: femur+patella 2.0-2.2 times longer than deep, tibia 4.1-4.7 (♂) (♀ 3.8-3.9) times, basitarsus 3.4-4.0 times, telotarsus 4.3-5.3 times longer than deep, basitarsus 1.1-1.3 times longer than telotarsus.

MEASUREMENTS (♂ ♀): Total length 1.60-1.98. Carapace 0.49-0.55/0.32-0.42. Pedipalps: femur 0.45-0.54/0.11-0.13, patella 0.35-0.45/0.12-0.13, hand with pedicel 0.29-0.37/0.21-0.28, pedicel length 0.05-0.06, finger length 0.42-0.56, chela length with pedicel 0.71-0.93. Leg I: femur 0.22-0.26/0.06-0.08, patella 0.10-0.13/0.06-0.08, tibia 0.16-0.19/0.04-0.06, basitarsus 0.14-0.18/0.03-0.04, telotarsus 0.11-0.14/0.02-0.03; leg IV: femur+patella 0.46-0.53/0.21-0.25, tibia 0.28-0.37/0.07-0.09, basitarsus 0.17-0.20/0.05-0.06, telotarsus 0.14-0.18/0.03-0.04.

REMARKS: This species has been recorded from Florida, in "palm and hardwood litter". On the five Galapagos islands where it occurs, it has been collected in litter of different plants, from the littoral zone up to an altitude of 1300 m, as well as in flight

interception traps, which implies phoretic behaviour and high dispersal possibilities. No differences have been observed between specimens from the five islands.

Aphelolpium longidigitatum (Ellingsen, 1910)

Opium longidigitatum Ellingsen, 1910: 310 (type locality: "Westindien" = West Indies, St. Thomas).

Apolpium longidigitatum (Ellingsen): Beier, 1977: 101 (Santa Cruz); Beier, 1978: 534-535 (Santa Fé, San Cristobal, Pinzon, Duncan).

Aphelolpium longidigitatum (Ellingsen): Muchmore, 1993: 32; Muchmore, 1997: 270-273, figs 1-6.

SPECIMENS STUDIED: **Baltra**: MHNG; 1 ♀; Flughafen (airport), *Opuntia*-Steppe unter Stein, 23.III.1997, leg. C. & B. Komposch. – **Espanola**: 1 ♀; Punta Suarez, 10 m, litter under bushes in seabird rookery, 10.VI.1985, leg. S. & J. Peck (85-187). – RBINS; 1 ♀; top of island, alt. 130 m, 17.IV.1991, leg. L. Baert, J.-P. Maelfait & K. Desender (B.91/676). – RBINS; 1 ♂, Bahia Manzanilla, camp site, 9 m, 21.III.2009, leg. L. Baert, F. Hendrickx & W. Dekoninck (B09/013). – RBINS; 1 ♂, Bahia Manzanilla, Caleta, 10 m, 22.III.2009, leg. L. Baert, F. Hendrickx & W. Dekoninck (B09/016). – **Gardner** at Espanola: 1T; "summit", dry zone with *Cordia lutea*, *Croton scouleri*, *Bursera graveolens*, *Lantana peduncularis*, grass and leaf litter on red soil, sifted, 30 m, 14.III.1987, leg. H. Schatz (87-H294). – 1 ♂ 1T 1D; *Bursera graveolens*, *Cordia leucophlyctis*, *Waltheria peduncularis*, litter and lava gravel, sifted, 14.III.1987, leg. H. Schatz (87-H300). – 1 ♂; hand sample, 14.III.1987, leg. H. Schatz (87-H303). – **Gardner** at Floreana: 1P; arid zone, litter, 2.V.1992, leg. S. Peck & J. Cook (92-148). – **Genovesa**: 39347; 1T; southern rim crater, sifting of dry litter of *Bursera* and *Croton*, with *Lantana*, dry rocky substrate, 23.X.1975, leg. W. G. Reeder. – 39316; 1 ♀; Arcturus Lake, 10 m, sifting of dead *Cyperus* clump above south margin of mangroves, 25.X.1975, leg. W. G. Reeder. – **Isabela**: 39298; 2 ♀; 5-6 km inland from Villamil, on road to Santo Tomas, screening of damp litter from lava cracks beneath *Waltheria*, 12.I.1977, leg. W. G. Reeder. – 39259; 1 ♂; 5-6 km N of Villamil on road to Santo Tomas, 40 m, beneath surface of lava rocks, cool damp sand substrate, 12.I.1978, leg. W. G. Reeder. – 39264; 1 ♂; eastern slope of Volcan Alcedo, 340 m, on or under exfoliating bark of *Bursera*, *Waltheria*, *Macraea*, 19.V.1980, leg. W. G. Reeder. – 1 ♂; Tagus Cove, arid zone, 100 m, carrion trap, 14.-22.V.1992, leg. S. Peck (92-182). – **Marchena**: RBINS; 1 ♂ 1 ♀; near fumaroles, 21.II.1974, leg. S. Jacquemart (97A). – **North Plazas**: 39310; 1T; 5 m, screening of *Sesuvium* litter, *Opuntia*-*Castela*-*Scutia* assoc., 20.X.1975, leg. W. G. Reeder. – **Pinzon**: RBINS; 24965; 1 ♂ 4 ♀ 1T; beach with *Sesuvium*, 20.I.1974, leg. S. Jacquemart (31B). – 39256; 1 ♂; 30 m, screening dry litter of *Prosopis* and *Croton* in rock crack, litter 2-5 cm deep, scoria below well drained, 2.II.1979, leg. W. G. Reeder. – 39292; 1 ♀; 290 m, from finch nest of lichen built in *Croton*, 2 m above ground, *Opuntia*-*Croton*-*Pisonia* assoc., 4.II.1979, leg. W. G. Reeder. – RBINS; 1 ♀; termite nest in Mosquera, arid zone, 130 m, 25.I.2010, leg. F. Hendrickx & W. Dekoninck (FH10/020). – RBINS; 1 ♂ 1 ♀; trail to summit, 227 m, 25.I.2010, leg. F. Hendrickx & W. Dekoninck (FH10/023). – RBINS; 1 ♂, trail to summit, *Opuntia*, 275 m, 25.I.2010, leg. F. Hendrickx & W. Dekoninck (FH10/024). – RBINS; 1 ♀; trail along the caldera red rock wall, 325 m, 25.I.2010, leg. F. Hendrickx & W. Dekoninck (FH10/025). – 1 ♀; Central valley, 270 m, tortoise dung, hand sample, 30.I.1987, leg. H. Schatz (87-H182). – **San Cristobal**: 39320; 1 ♂; Alida de Frigata, W of Wreck Bay, under loose bark and decaying branches of *Bursera*, *Waltheria*, *Croton*, *Jasminocereus*, 9.II.1978, leg. W. G. Reeder. – 2 ♂ 1D; 3 km SE Wreck Bay, littoral zone, soil washing under *Croton*, 16.III.1996, leg. S. Peck (96-27). – 39367; 1D; Cerro Felado, 450 m, from litter and moss-fern growth, base of lava blocks, soil well-drained, litter thin, *Scalesia*-*Psychotria*-*Chiococca*-*Zanthoxylum* comm., 17.II.1978, leg. W. G. Reeder. – **Santa Cruz**: RBINS; 1D; dry arid zone, 14.II.1974, leg. S. Jacquemart (86). – RBINS; 1 ♀; Cerro Colorado, 25.V.1975, leg. H. Franz (SA-292). – RBINS; 1T; bord de la mer, 10.I.1974, leg. S. Jacquemart (7). – 1 ♀ 5P; CDRS, 10 m, arid, *Opuntia* forest, soil and rotten cactus, 19.I.1989, leg. S. Peck (89-15). – 1 ♂ 2D 1P; CDRS, 10 m, tortoise dung and hay, 7.II.1989, leg. S. Peck (89-36). – 1 ♂; CDRS, Grieta Iguana, damp soil Berlese, 2.IV.1989, leg. J. & S. Peck (89-178). – MHNG; 1 ♀ 1T; CDRS, Malaise-thought, 27.-31.I.1989, leg. B. J. Sinclair. – MHNG; 1 ♂; fruit baited yellow trap, 27.I.-9.II.1989, leg. B. J. Sinclair. – CDRS; 1 ♂; CDRS, dormitorio, 19.VIII.1988, leg. S. Abedrabbo. – CDRS; 2D; barranco CDRS, suelo ex Hoja rasco,

12.XI.1991, leg. S. Abedrabbo. – CDRS; 1 ♀; barranco CDRS, pitfall trap, 10.XI.-10.XII.1992, leg. S. Abedrabbo. – CDRS; 1 ♂; Tortuga Bay, pitfall trap, 7.II.-7.III.1993, leg. S. Abedrabbo. – CDRS; 1 ♀; Tortuga Bay, pitfall trap, 7.IV.-7.V.1993, leg. S. Abedrabbo. – CDRS; 1 ♂; Tortuga Bay, pitfall trap, 10.XI.-10.XII.1992, leg. S. Abedrabbo. – 34099; 1T; transect from Caseta south to coast, 60 m, Quadrat E-2, 23.VIII.1970, leg. W. G. Reeder. – 39286; 1 ♀; transect from Caseta south to coast, 40 m, Quadrat E-2, 24.VIII.1970, leg. W. G. Reeder. – 39291; 1 ♀; transect from Caseta south to coast, 30 m, Quadrat D-1, 24.VIII.1970, leg. W. G. Reeder. – RBINS; 1 ♂ 2 ♀; Bahía Ballena, shrubs, 26.I.2010, leg. F. Hendrickx & W. Dekoninck (FH10/030). – RBINS; 1 ♀ 1T; Bahía Ballena, beach, *Vesuvium* vegetation, 2 m, 26.I.2010, leg. F. Hendrickx & W. Dekoninck (FH10/031). – 1 ♀; 0.5 km SW Puerto Ayora, litter at bottom of Grieta, alt. 1 m, 1.II.1989, leg. S. Peck (89-24). – 1T; 3 km W Bellavista, Finca Vilema, 210 m, avocado leaf litter, 19.IV.1992, leg. J. Cook & S. Peck (92-129). – 1D; south-east, Punta Roca fuerte, arid coast, *Cordia* litter, 7.V.1992, leg. S. Peck (92-161). – 1 ♀; Cerro Crocker summit, 875 m, fern litter, 3.V.1996, leg. S. Peck (96-154). – 1P; barranco north CDRS, near water tank, dry zone, 60 m, decayed cactus litter and soil, under dead *Opuntia echios* var. *gigantea*, 9.III.1988, leg. H. Schatz (88-808). – **Santa Fé**: 39263; 1 ♂ 2 ♀ 1T; 400 m SSW of Camp Bay, 40-50 m, screened from litter of *Scalesia helleri* and *Cordia lutea*, blocky talus, base first barranco, 23.I.1979, leg. W. G. Reeder. – 39260; 1T; 1.75 km SSW of Camp Bay, 130 m, from *Oryzomys* nest of *Opuntia* fibers under downed *Opuntia* trunk, *Bursera* area, 25.I.1979, leg. W. G. Reeder. – 39249; 1T; 1.75 km SSW of Camp Bay, screened from debris of *Cryptocarpus* bower over rock, organic litter but very dry, 25.I.1979, leg. W. G. Reeder. – 39368; 1 ♀; 1.75 km SSW Camp Bay, 130-150 m, under rocks in *Opuntia*, *Waltheria*, *Bursera*, soil very dry, 25.I.1979, leg. W. G. Reeder. – RBINS; 1 ♀; dry arid zone, 50-100 m, dry riverbed, litter between rocks, 1.-2.IV.1982, leg. L. Baert & J.-P. Maelfait (LB1-2.4.1). – 1 ex.; Highland, alt. 150 m, 24.IV.1991, leg. L. Baert (718). – RBINS/MHNG; 1T 4D; alt. 0 m, *Scalesia* litter, 5.IV.1989, leg. S. Peck (89-209). – CDRS; 1T; sector turístico, ex suelo, III.1986, leg. S. Abedrabbo. – CDRS; 1 ♂ 1 ♀; sector turístico, bajo rocas, XI.1990, leg. S. Abedrabbo. – **Santiago**: RBINS; 2 ♀; north slope, alt. 100 m, 4.III.1986, leg. L. Baert, J.-P. Maelfait & K. Desender (B.86/049). – RBINS; 1 ♂; Highland, 800 m, 6.III.1986, leg. L. Baert, J.-P. Maelfait & K. Desender (B86/062). – **South Plazas**: 39262; 2 ♂; 10-12 m, screening of damp litter under *Opuntia* pad and rotting *Opuntia* stump base, 19.III.1975, leg. W. G. Reeder. – 2 ♂ 1 ♀ 3T 1D 1P; arid shrubs and succulent litter, 6.V.1992, leg. S. Peck (92-162). – **Venecia**: RBINS; 2 ♀; mangrove litter, 17.IV.1982, leg. L. Baert & J.-P. Maelfait (LB17.4.1). – RBINS; 1 ♂; mangrove litter, 18.II.1982, leg. L. Baert & J.-P. Maelfait (LB18.4.1).

SHORT DESCRIPTION (12 ♂ 14 ♀ from all islands): Carapace 1.3-1.6 times longer than broad, with 4 setae + 1 preocular seta on each side at anterior border and 4 setae at posterior border; tergites I/II mostly with 4, the following with 6-8 setae; setae on last tergites forked; sternites: mostly with 6-8 setae, III/IV without suprastigmal setae. Chelicera: movable finger with a two-pointed subapical lobe, galea slender, with 3 apical branchlets, serrula exterior with 18-20 lamellae, rallum with 2 dentate setae. Pedipalps with finely granular femur and patella, femur 3.9-4.4 times (1 ♂ from South Plaza 4.8 times) longer than broad, patella 3.5 times, hand distinctly cordiform, with pedicel 1.0-1.1 times, finger 1.3-1.5 times longer than hand with pedicel, chela with pedicel 3.0-3.3 times (♂) (♀ 2.6-3.0), without pedicel 2.8-3.1 times (♂) (2.4-2.8) longer than broad; trichobothrial pattern as described by Muchmore (1997), “sword-like” setae present on both chelal fingers. Chelal fingers not gaping in males and small females (chela length about 1.20 mm), but distinctly gaping in large females (chela length longer than 1.25 mm). Leg I: femur about twice as long as patella; femur 3.4-4.1 times longer than deep, patella 1.8-2.1 times, tibia 3.9-5.5 times, basitarsus 4.0-5.4 times, telotarsus 4.7-5.9 times longer than deep; leg IV: femur+patella 2.1-2.9 times longer than deep, tibia 3.9-5.6 times, basitarsus 3.5-4.7 times, telotarsus 4.4-5.2 times longer than deep.

MEASUREMENTS of ♂ (♀): Carapace 0.59-0.74/0.40-0.50 (0.60-0.78/0.41-0.53). Pedipalps: femur 0.61-0.77/0.15-0.18 (0.62-0.81/0.16-0.21), patella 0.54-0.69/0.16-0.20 (0.51-0.69/0.17-0.23), hand with pedicel 0.43-0.57/0.32-0.42 (0.44-0.62/0.38-0.59), length of pedicel 0.07-0.08 (0.06-0.10), length of finger 0.61-0.82 (0.64-0.88), length of chela with pedicel 1.03-1.34 (1.09-1.46). Leg I (♂ ♀): femur 0.29-0.38/0.08-0.10, patella 0.14-0.18/0.08-0.09, tibia 0.22-0.29/0.06, basitarsus 0.18-0.23/0.04-0.05, telotarsus 0.13-0.17/0.02-0.03; leg IV (♂ ♀): femur+patella 0.59-0.72/0.27-0.34, tibia 0.39-0.49/0.10-0.12, basitarsus 0.21-0.29/0.06-0.07, telotarsus 0.18-0.22/0.04-0.05.

REMARKS: Muchmore (1997) redescribed this species in detail and designated a female lectotype. The specimens from the Galapagos islands clearly belong to the genus *Aphelolpium* (rallum consisting of 2 blades, long venom ducts, trichobothrium *ist* near *it*, *est* in middle of finger, tergites with 6-8 setae), despite Muchmore's (1997) doubts. The specimens show most of the important specific characters of *longidigitatum*, but appear to have a slightly more slender pedipalpal patella (3.0-3.5 vs. 2.7-3.0 times longer than broad). As Beier (1978) had already pointed out, variability seems to be high in this species (length of femur 0.57-0.75 mm, length of patella 0.48-0.52 mm; it is even higher in the present samples), but I could not find species-specific differences between specimens from different islands.

The presence of this species on most of the islands from the seashore up to 800 m altitude and in quite different habitats indicates an "old" invasion, but not early enough to have allowed diversification on the different islands. Its occurrence on Venecia might, furthermore, be explained by the transport of about 100 m³ of soil from Santa Cruz to Venecia in about 1975, for creating an artificial nesting area for the land iguana *Conolophus subcristatus* (Gray, 1831) (see www.galapagos.org).

Stenolpium insulanum Beier, 1978

Stenolpium insulanum Beier, 1978: 535-536, fig. 2 (type locality: San Cristobal, Playa Ocohova).

SPECIMENS STUDIED: **Isabela**: 1T 1D; Sierra Negra, 800 m, fern-moss litter, 13.III.1989, leg. S. Peck (89-130). – **San Cristobal**: RBINS; 1♂ 1♀ 1D; dry arid zone, 2.II.1974, leg. S. Jacquemart (70). – RBINS; 2♂ 1♀; road from Puerto Baquerizo to Progreso, culture zone, 250 m, 4.III.1982, leg. L. Baert & J.-P. Maelfait (LB 4.3.3). – RBINS; 1T; arid zone, coast, 0-2 m, 4.II.1974, leg. S. Jacquemart (72). – 39214; 1♂ 1♀; Cerro Pelado, 450 m, wood, *Opuntia*, *Macraea*, *Croton*, 17.II.1979, leg. W. G. Reeder. – 1♀; 3 km SE Baquerizo, *Cryptocarpus* litter at Iguana roost, 17.II.1989, leg. S. Peck (89-69). – 1♂; Cerro de las Tijeretas, dry zone, *Maytenus*, *Waltheria*, *Scutia*, sifted from litter, 1.IV.1985, leg. H. & I. Schatz (85-H91). – **Santa Cruz**: 1T; CDRS, littoral zone, high tide zone, litter under mangroves, 30.I.1989, leg. S. Peck (89-1).

SHORT DESCRIPTION (2♂ 2♀ from San Cristobal): Carapace with about 42-50 setae, 6 at anterior and 4 at posterior border; tergite I with 6-9 setae, II 8-9, III 9-11, the following ones 12-15 setae, setae on last tergites smooth; male genital opening with 2-3 setae on each side; anterior genital operculum with 8-12 median discal setae and 3-4 closely set median marginal setae (♂), or 4-5 median discal setae (♀); sternite III with 6-8 setae, IV 6-19, suprastigmal setae absent, tracheal trunks not inflated at their base, following sternites mostly with 12-15 setae. Chelicera: 5 long smooth setae on hand, galea long, with forked apex and one subdistal branch, a tooth-like subapical

lobe present; serrula exterior 22-24 lamellae, rallum with 2 unequal setae. Pedipalps finely granular, trochanter with low dorsal hump, femur with a dorsal tactile seta in basal third (TS=0.23-0.26), 3.2-3.3 times longer than broad, patella 2.5-2.7 times, club 1.9-2.0 times, hand with pedicel 1.6 times, chela with pedicel 2.8-2.9 times longer than broad, finger 1.1-1.2 longer than hand with pedicel; fixed finger with 42-44 teeth with tiny posterior point, movable finger with 40-46 teeth, those in basal half broader and flattened, partly indistinct; venom duct short, nodus ramosus distal to *t* in movable finger, distinctly distal to *it* in fixed finger, trichobothrium *est* halfway between *ist* and *it*; lanceolate setae absent on fingers. Leg I: femur 3.2-3.6 times longer than deep and 1.6 times longer than patella, patella 2.2-2.3 times, tibia 4.0-4.5 times, basitarsus 3.8-4.0 times, telotarsus 4.2-4.7 times longer than deep; leg IV: femur+patella 2.2-2.5 times, tibia 3.6-4.2 times, basitarsus 3.4-3.9 times, telotarsus 3.8-4.8 times longer than deep, chaetotaxy of basitarsus TS+3/3/3-4, arolia undivided, longer than smooth claws.

MEASUREMENTS of ♂ (♀): Total length 2.4-2.6 (2.2-3.6). Carapace 0.74-0.76/0.53-0.57 (0.67-0.88/0.56-0.63). Pedipalps: femur 0.62/0.19 (0.64-0.74/0.19-0.23), patella 0.64/0.24-0.25 (0.64-0.74/0.25-0.29), hand with pedicel 0.59-0.61/0.38-0.39 (0.64-0.78/0.41-0.49), length of pedicel 0.09 (0.08-0.11), length of finger 0.56-0.57 (0.54-0.63), length of chela with pedicel 1.12 (1.13-1.36). Leg I: femur 0.33/0.10 (0.33-0.39/0.10-0.11), patella 0.21/0.09 (0.20-0.25/0.09-0.11), tibia 0.29-0.30/0.07 (0.19-0.22/0.05-0.06), basitarsus 0.19/0.05 (0.19-0.22/0.05-0.06), telotarsus 0.16-0.17/0.04 (0.17-0.20/0.04); leg IV: femur+patella 0.62-0.63/0.27-0.29 (0.63-0.73/0.27-0.30), tibia 0.48/0.13 (0.48-0.57/0.13-0.14), basitarsus 0.25-0.26/0.07 (0.25-0.31/0.08), telotarsus 0.21-0.22/0.05 (0.19-0.25/0.05).

REMARKS: Beier (1978) described this species from the island of San Cristobal. It seems to be quite frequent there, from the littoral zone up to an altitude of 450 m, and prefers dry habitats. The presence of the species on the islands of Isabela and Santa Cruz is established from a few nymphal specimens only.

GARYPINIDAE

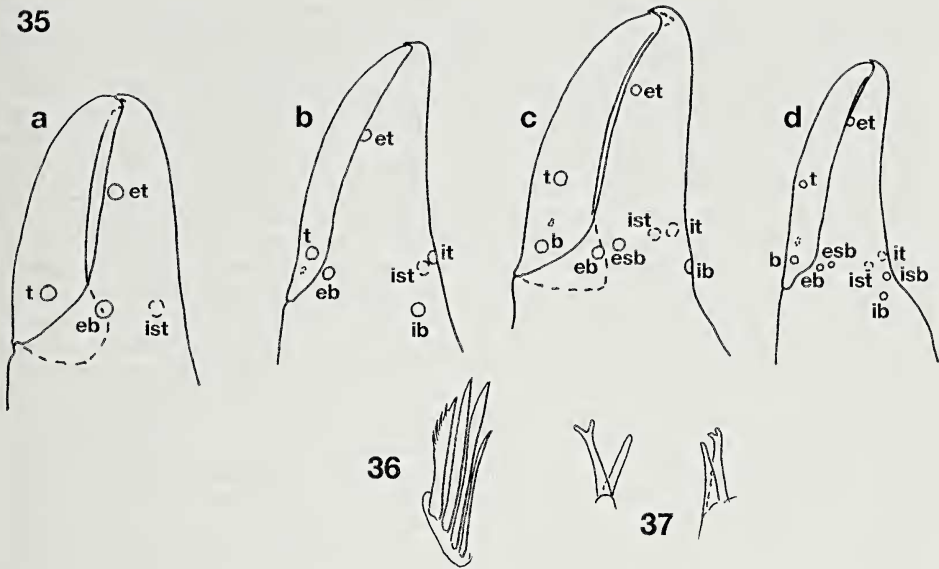
Galapogodinus franzi Beier, 1978

Figs 35-37

Galapogodinus franzi Beier, 1978: 538-540, fig. 4 (type locality: Santiago, Jabosillo).

SPECIMENS STUDIED: **Fernandina**: RBINS; 1♀; Punta Espinosa, 24.III.1988, leg. L. Baert, J.-P. Maelfait & K. Desender (B.88/473). – 1♂; 5 km NE Cabo Hammond, 110 m, Cerro Verde, transect forest, FIT, 4.-11.V.1991, leg. S. & J. Peck (91-120). – **Floreana**: 1 ad.; 6 km E Black Beach, 380 m, *Scalesia* forest, FIT, 21.-28.III.1989, leg. S. Peck & B. J. Sinclair (89-143). – 1♂; 5 km E Black Beach, 250 m, transition zone, FIT, 22.-28.III.1989, leg. S. Peck & B. J. Sinclair (89-145). – 1♂ 1♀; Cerro Pajas, 325 m, forest interior, Malaise, 27.III.-22.IV.1996, leg. S. Peck (96-56). – 1♀ 1T; Cerro Pajas, 325 m, forest interior, FIT, 27.III.-18.IV.1996, leg. S. Peck (96-57). – 1P; on base of Cerro Pajas near Camp site, moist highland, 360 m, under *Scalesia pedunculata*, *Croton scouleri* var. *brevifolius*, *Lantana camara*; leaf litter, humus and pieces of wood, 17.I.1987, leg. H. Schatz (87-518). – 2♀ 6P; highland north of Cerro Pajas, cultivated zone, 320 m, lichens on bark of dead *Citrus limetta*, near *Psidium guajava*, 17.I.1987, leg. H. Schatz (87-523). – 1♀; highland near caves under Cerro Asilo de la paz, cultivated area, 340 m, leaf litter with roots and humus, crevice under *Lantana camara*, 17.I.1987, leg. H. Schatz (87-529). – 1T; at Cerro Pajas, southwestern crater rim, moist highland, 550 m, in bushy forest by *Lantana camara*, *Zanthoxylum fagara*, *Croton scouleri* var. *brevifolius* leaf litter, 19.I.1987, leg. H. Schatz (87-543). – **Genovesa**: 39328; 1T; 100 m S of south rim crater, 60 m, screened from dry finch nest in *Cordia*, 23.X.1975, leg. W. G. Reeder. – 73192; 1♂; Bursera Hills, SE

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FIGS 35-37

Galapagodinus franzi Beier, 1978. (35) Trichobothrial pattern of protonymph (a), deutonymph (b), tritonymph (c), female (d). (36) Rallum. (37) Galea in lateral view (left) and in dorsal view.

crater rim, 500 m, sweeping in *Chamaesyce viminea*, *Bursera*, *Croton*, *Waltheria*, bare lava plates, little *Bursera* litter, 25.X.19756, leg. W. G. Reeder. – **Gardner** at Espanola: 39330; 1♂; 20 m, sweeping in *Bursera* foliage (yellowing, being to fall), *Cordia*, *Croton*, *Opuntia*, *Lantana*; 13.II.1977, leg. W. G. Reeder. – 39321; 2♂; 30 m, screened from foliose lichen growing in *Bursera*, 13.II.1977, leg. W. G. Reeder. – **Isabela**: 39336; 1♀; 0.5 km E of Villamil, 0-5 m, from lava walls and *Conocarpus* stems surrounding brackish water pools in lava sinks, 30.I.1978, leg. W. G. Reeder. – 34356; 1♀; Volcan Darwin, Pega Pega Camp, 1000 m, sweeping *Scalesia*, 24.-25.V.1980, leg. D. Green. – 39266; 1♀; Volcan Darwin, western slope, 360-380 m, west of lava flow, beating in *Pisonia*, *Macraea*, *Croton*, *Tournefortia psilostachya*, *Opuntia*, *Ciococca*, 25.V.1980, leg. W. G. Reeder. – 34261; 1♀; Volcan Darwin, 1230-1260 m, *Scalesia* sweep, 3-4 m height; some *Zanthoxylum*, *Cordia*, *Darwiniothamnus*, “green berry”, 29.V.1980, leg. W. G. Reeder. – 39007; 1♀; Volcan Alcedo, rim camp, sweeping *Darwiniothamnus*, 17.V.1980, leg. W. G. Reeder. – 39179; 1T 1D; Volcan Alcedo, Lynn Fowler’s Camp, 1045 m, 220 m to fumaroles, sweeping in *Tournefortia* stand with *Ipomoea alba*, 17.V.1980, leg. W. G. Reeder. – 39199; 1♂ 1♀; Volcan Alcedo, Lynn Fowler’s Camp, 1045 m, screened from epiphytic lichens from *Zanthoxylum* and *Tournefortia*, 17.V.1980, leg. W. G. Reeder. – 1♂; Volcan Alcedo, NE crater rim, 1100 m, shrub forest, 21.-25.VI.1991, leg. S. Peck (91-247). – 2♂ 1♀; Volcan Alcedo, S crater rim, 1100 m, *Scalesia*-fern litter, 22.VI.1991, leg. S. Peck (91-250). – 5 adults & 5 nymphs; Alcedo, SE crater rim, 1150 m, tree fern litter, 23.IV.1991, leg. S. Peck (91-251). – 55 adults & nymphs; Alcedo, SE crater rim, 1150 m, Berlese of moss and epiphytes on trees, 23.VI.1991, leg. S. Peck (91-252). – 1♀; Cerro Azul, Calet alguana, under bark of dead manchineel, 5 m, 26.V.1991, leg. S. & J. Peck (91-172). – 1♀; 13 km NW Villamil, Jaboncillo forest, 130 m, FIT, 22.-30.IV.1996, leg. S. Peck (96-128). – TNSC 39308; 1♀; Alemania, 350 m, sweeping in fern, *Tournefortia rufo-sericea*, in *Scalesia-Zanthoxylum*-stand, 22.I.1977, leg. W. G. Reeder. – 39340; 1♂; Sierra Negra, road to Sierra Solitaria, 200 m, screened from epiphytic moss on *Psidium galapageium* and *Zanthoxylum*, *Scalesia-Guayavilla* assoc., 25.I.1975, leg. W. G. Reeder. – MHNG; 1♀; Sierra Negra, W base Nispero Camp, Alemania, 350 m, grass sweeping, 28.IV.1996, leg. S. Peck (96-133). – 2♂; Santo Tomas, humid forest, FIT, 4.-15.III.1989,

leg. S. Peck & B. J. Sinclair (89-100). – 1D; Santo Tomas, 300 m, for. bracket fungi, 14.III.1989, leg. S. Peck (89-128). – 3♀; 4 km NW Santo Tomas, 500 m-800 m, moss forest litter, 13.-14.III.1989, leg. S. Peck (89-130). – 1P; Sierra Negra, in “Trocha”, transition/*Scalesia* zone, 230 m, under *Sapindus saponaria*, dead moss and rotten pieces of wood, from barks, 7.III.1987, leg. H. Schatz (87-618). – 1♂; Sierra Negra, W Villamil near Quinta Playa, Dry zone, 20 m, under *Pisonia floribunda*, well decayed leaf litter, 8.II.1987, leg. H. Schatz (87-626). – 1P; Sierra Negra, southern crater rim, Fern Sedge, unburnt area, pasture zone-pampa, 1000 m, under *Pteridium aquilinum* and *Centella asiatica*, partially decayed leaf litter, 10.II.1987, leg. H. Schatz (87-642). – 1♀; Sierra Negra, southwestern crater rim, pasture zone-pampa, 910 m, in Guyaba forest with *Psidium guajava*, lichens on bark of *Sapindus saponaria*, 11.II.1987, leg. H. Schatz (87-646). – 1D 2P; Sierra Negra, Volcan Chico, pasture zone-pampa, 1000 m, lichens on dead log, 11.II.1987, leg. H. Schatz (87-650). – 1P; Sierra Negra, southwestern rim, pasture zone-pampa, 940 m, under *Psidium guajava*, *Borreria laevis*, *Cyperus brevifolius*, *Centella asiatica*, *Sida hederifolia*; decayed leaf litter with pieces of wood and soil, 11.II.1987, leg. H. Schatz (87-652). – 1T; Punta Garcia north Volcan Alcedo, Dry zone, 20 m, under *Bursera graveolens*, *Cordia lutea*, *C. leucophlyctis*, leaf litter and soil, 21.II.1987, leg. H. Schatz (87-702). – 4♀ 2T 2P; Volcan Alcedo, inside of crater, below sulphur areas, *Psychotria* zone - Elfín forest, 760 m, dense *Croton* forest, *Croton scouleri* var. *scouleri*, *Tournefortia rufo-sericea*, on *Pisonia floribunda*, lichens from bark, 24.III.1988, leg. H. Schatz (88-902). – **Marchena**: 39304; 1♀; south slope, 160-170 m, sweeping in fumarole canyon, *Chamaesyce*, *Tournefortia*, *Croton* and carilla de caballo, 26.I.1977, leg. W. G. Reeder. – 1♀; SW Playa, arid zone, *Bursera* forest, FIT, 30 m, 12.-24.III.1992, leg. S. Peck (92-29). – **Pinta**: 39268; 1♀; south slope, 450 m, sweeping in trees and shrubs, *Psychotria*, *Pisonia*, *Croton*, *Zanthoxylum*, *Tournefortia*, *Commelina*, grasses, 20.I.1977, leg. W. G. Reeder. – 39326; 1T; 400 m, sweeping and beating in dry perennial grass (*Paspalum*?) pampa with *Zanthoxylum*, *Pisonia*, 18.VII.1977, leg. W. G. Reeder. – 39251; 1♂; south slope, 420 m, sweeping in *Salvia* and *Darwiniothamnus*, *Zanthoxylum* savanna, 19.VII.1977, leg. W. G. Reeder. – 39248; 2♀; south slope, 550 m, sweeping in *Psychotria*, *Zanthoxylum*, *Salvia*, *Tournefortia*, 23.VII.1977, leg. W. G. Reeder. – 1♂ 4♀; Playa Ibbetson, 40 m, open *Bursera* forest, FIT, 13-22.III.1992, leg. S. Peck (92-37). – 1♂ 1T; trans[ition] zone forest (*Bursera*, *Trema*, *Zanthoxylum*), 200 m, FIT, 14-22.III.1992, leg. S. Peck (92-39). – 1♀; *Zanthoxylum*-lichen humid forest, FIT, 400 m, 14-22.III.1992, leg. S. Peck (92-41). – 1T; *Trema-Zanthoxylum* litter, 350 m, Berlese, 19.III.1992, leg. S. Peck (92-53). – 1♂; southern part, near coast, Lower Dry zone, 30 m, *Waltheria ovata*, *Bursera graveolens*, partially decayed leaf litter under *Waltheria*, 30.IV.1988, leg. H. Schatz (88-945). – **Pinzon**: 4♂ 3♀ 3T 1D 1P; SE slope, 380 m, “pampa”, litter sifting, 27.VI.1991, leg. S. Peck (91-255). – 1T; southern crater rim of main caldera, *Scalesia* zone, 320 m, under *Cordia lutea*, leaf litter, 30.I.1987, leg. H. Schatz (87-G055). – 3P; Central valley, Upper Dry zone, 290 m, lichens from *Opuntia galapageia* var. *macrocarpa*, arboricolous lichens, 30.I.1987, leg. H. Schatz (87-566). – 1P; Central valley, Upper Dry zone, 290 m, under *Acacia macracantha*, *Croton scouleri*, *Scalesia incisa*, *Alternanthera filifolia*, *Opuntia galapageia* var. *macrocarpa*, grass litter, 30.I.1987, leg. H. Schatz (87-567). – 1♀; Central valley, Upper Dry zone, 290 m, grass litter, under *Acacia macracantha* and *Croton scouleri*, 30.I.1987, leg. H. Schatz (87-568). – 2P; Central valley, western part, Upper Dry zone, 270 m, *Croton scouleri* forest with *Lantana peduncularis*, *Acacia macracantha*, *Cordia leucophlyctis*, different lichens from barks of *Croton*, 30.I.1987, leg. H. Schatz (87-574). – 1♂, southern crater rim of main caldera, *Scalesia* zone, 310 m, under *Cordia lutea*, decayed leaf litter with pieces of wood, 31.I.1987, leg. H. Schatz (87-578). – 1♀ 1P; southern crater rim of main caldera, at “castle”, *Scalesia* zone, 310 m, lichens from dead *Cordia leucophlyctis*, 31.I.1987, leg. H. Schatz (87-587). – 1D; passage to southern slope, beside big rock, Fern Sedge zone, 340 m, *Croton scouleri*, *Alternanthera echinoccephala*, under *Cordia leucophlyctis*; decayed leaf litter and black soil, 3.II.1987, leg. H. Schatz (87-603). – 1♀; eastern part, Lower Dry zone, 140 m; leaf litter and humus under *Croton scouleri* and *Cordia lutea*, 3.II.1987, leg. H. Schatz (87-607). – 1D; eastern part, near landing site (opposite Isote, a tiny island), Lower Dry zone, 30 m, under *Prosopis juliflora*, leaf litter and decayed wood from bark, 4.II.1987, leg. H. Schatz (87-608). – 1P; Central valley, western part, Upper Dry zone, 270 m, under *Acacia macracantha*, dead grass litter and humus, 30.I.1987, leg. H. Schatz (87-573). – **Rabida**: MHNG; 1♂; NE coast, 250 m, arid Palo Santo zone, 2.VI.1991, leg. J. Heraty (H91-072). – **San Cristobal**: 33942; 1♀; Cerro Pelado, 430-450 m, *Scalesia cordata*-stand with

Chiococca, *Psychotria*, *Zanthoxylum*, sweeping, 17.II.1979, leg. W. G. Reeder. – 39367; 1 ♀ 1P; Cerro Felado, 450 m, from litter and moss-fern growth, base of lava blocks, soil well-drained, litter thin, *Scalesia-Psychotria-Chiococca-Zanthoxylum* comm., 17.II.1978, leg. W. G. Reeder. – 1T; lake El Junco, *Miconia*/Fern-sedge zone, 650 m, under *Psidium guaja* and *Pteridium aquilinum*, in moss, 28.III.1985, leg. W. Schatz (85-294). – 1D; lake El Junco, 680 m, *Miconia* zone, leaf litter, moss and pieces of wood under *Miconia robinsoniana*, 29.III.1985, leg. H. & I. Schatz (85-305). – 1D; San Joaquin, fern zone, under *Furcraea cubensis* and *Pteridium aquilinum*, decayed leaf litter and pieces of wood, 680 m, dry to moist, 30.III.1985, leg. H. & I. Schatz (85-317). – 1T; at lake El Junco, eastern part, *Miconia* zone, 630 m, *Lycopodium dichotomum* on bough of *Miconia robinsoniana*, pads of *Lycopodium*, 3.I.1987, leg. H. Schatz (87-G047). – MHNG; 1 ♀; Puerto Baquerizo, south beach littoral, yellow pan traps, 14.-21.II.1989, leg. B. J. Sinclair. – 1 ♀; Progreso 1 km E Guava, ravine, 370 m, 15.-23.II.1989, FIT, leg. S. Peck & B. J. Sinclair (89-62). – 2♂; 5 km E Wreck Bay, arid zone, 100 m, 14.-19.III.1996, leg. S. Peck (96-15). – **Santa Cruz**: 39276; 1 ♂ 1 ♀; Cerro Colorado, 7-10 m, suction sample from *Opuntia echios*, arid zone vegetation, lava outcrops, 11.III.1975, leg. W. G. Reeder. – 39250; 1 ♀; north slope of Mount Crocker, 500 m, NE of Puntudo Pass, sweeping in canopy of *Scalesia pedunculata*, 4.V.1980, leg. W. G. Reeder. – 2 ♀; Puntudo, 650 m, *Scalesia* forest, FIT-trough, 1.-29.II.1989, leg. S. Peck & B. J. Sinclair (89-41). – 1 ♀; Puntudo, 650 m, *Scalesia* forest, 1.-30.III.1989, leg. S. Peck & B. J. Sinclair (89-171). – 2D; near Media Luna, 600 m, *Miconia* zone, water crevice, under *Miconia robinsonia* and *Pteridium aquilinum arachnoideum*, moss and fern litter, 6.II.1985, leg. H. & I. Schatz (85-101, 85-103). – 1T; near Media Luna, *Miconia* zone, 600 m, in *Sphagnum* (dripping wet), 6.II.1985, leg. W. Schatz (85-107). – 3♂ 2♀ 1T 1P; Los Gemelos, 3 km N Santa Rosa, *Scalesia* forest, 570 m, FIT and Malaise, 13.VI.-15.VII.1985, leg. S. & J. Peck (85-188b). – 1 ♀; same locality, *Scalesia* forest litter, 13.VI.1985, leg. S. & J. Peck (85-188a). – 3♀ 1T; Los Gemelos, *Scalesia* forest, 610 m, FIT, 1.-28.II.1989, leg. S. Peck & B. J. Sinclair (89-82). – 1♂; Los Gemelos, *Scalesia* forest, *Scalesia pedunculata* and *Zanthoxylum fagara*, from rotten *Scalesia* trunk, 14.IV.1985, leg. H. & I. Schatz (85-H98). – 2 ♀; 1.7 km N Santa Rosa, 550 m, *Scalesia*, Malaise-FIT, 1-30.VI.1991, leg. S. & J. Peck (91-113). – 1 ♀; 1.7 km N Santa Rosa, *Scalesia* forest, Malaise trap, 1-30.VI.1991, leg. S. Peck (91-233). – 1 ♀; 13 km N Santa Rosa, 300 m, arid zone, *Bursera* forest, FIT, 1-30.IV.1992, leg. S. Peck (92-81). – 1D; south of Puerto Ayora, 10 m, lagoons behind Hotel Delfin, forest of *Opuntia echios* var. *gigantea*, dead cactus litter, 5.II.1985, leg. H. & I. Schatz (85-52). – 1 ♀; near Los Gemelos, *Scalesia* zone, 590 m, under *Scalesia pedunculata* and *Tournefortia rufo-sericea*, well decayed leaf litter, 8.III.1987, leg. H. Schatz (87-G072). – 1P; *Scalesia* forest near Cerro Crocker, 700 m, moss from *Scalesia pedunculata* trunk, 6.III.1987, leg. H. Schatz (87-724). – 1 ♀, *Scalesia* forest near Cerro Crocker, 700 m; bark, lichens and moss from *Scalesia pedunculata* trunk, 6.III.1987, leg. H. Schatz (87-723). – 1T; near Puntudo, beside Azolla lava bubble, Fern Sedge zone, 720 m, moss and lichens from rock, 6.III.1987, leg. H. Schatz (87-730). – **Santa Fé**: 39249; 1♂; 1.75 km SSW of Camp Bay, screened from debris of *Cryptocarpus* bower over rock, organic litter but very dry, 25.I.1979, leg. W. G. Reeder. – 1♂; north-eastern part, at cliff, dry zone; 30 m, under *Cordia lutea* and *Waltheria ovata*, decayed leaf litter and humus, 22.I.1987, leg. H. Schatz (87-559). – **Santiago**: 39311; 1♂; Bahía Bucanera, 60-70 m, sweeping in *Castela* and *Chiococca*, peninsula between N and S bays, 13.IX.1975, leg. W.G. Reeder. – 39377; 1♂; 520 m, Guayavillo quadrat, ca. 5 km SE Bahía Bucanera, sweeping in open Guayavilla parkland, heavy undergrowth of annual herbs, 20.IV.1975, leg. W. G. Reeder. – 39359; 1 ♀; Crater area, 875 m, picked from rotten dead *Zanthoxylum* trunks, substrate dry with dry forbs, *Zanthoxylum* dominant, 20.IX.1975, leg. W. G. Reeder. – 39378; 1 ♀; summit crater area, 850 m, *Zanthoxylum*, savanna with garua drip patches of grazed green forbs and grasses, 14.-23.IX.1975, leg. W. G. Reeder. – 39306; 1♂; 15 km of summit crater, 875 m, tree fern valley, sweepnetting in *Tournefortia*, badly overgrazed, *Zanthoxylum* dominant, 3-5 ft, 21.IX.1975, leg. W. G. Reeder. – 39372; 1 ♀ 1P; lower southern crater, 750 m, sweeping in *Tournefortia* and cafetillo, *Zanthoxylum* dominant, N.W. crater rim, 22.IX.1975, leg. W. G. Reeder. – 39379; 1 ♀; lower southern crater, 750 m, NW rim of crater, in and under rotten *Zanthoxylum*, open grassland, 22.IX.1975, leg. W. G. Reeder. – 39319; 1♂; summit, 930 m, within dead fern fronds dependant from lava boulders, overgrazed, *Zanthoxylum* with green forbs, 23.IX.1975, leg. W. G. Reeder. – **Seymour Norte**: CDRS; 3♂; ex suelo, 22.I.1989, leg. S. Abedrabbo.

REMARKS: This species is widespread all over the islands and has been collected in quite varied biotopes, from the coast up to an altitude of about 1000 m. The absence of trichobothrium *est* on the fixed chelal finger, as noted Beier (1978), is confirmed by the study of the trichobothrial pattern of the nymphal stages (Fig. 35).

Serianus elongatus sp. n.

Figs 38-42

HOLOTYPE: MHNG; ♀; **Isabela**: Bahia Elisabeth, in pitfall trap installed in cracks of a recent lava field, 18.-21.IV.1991, leg. Isabella Lavas & P. Oromi.

ETYMOLOGY: The specific name (a Latin adjective) means elongated.

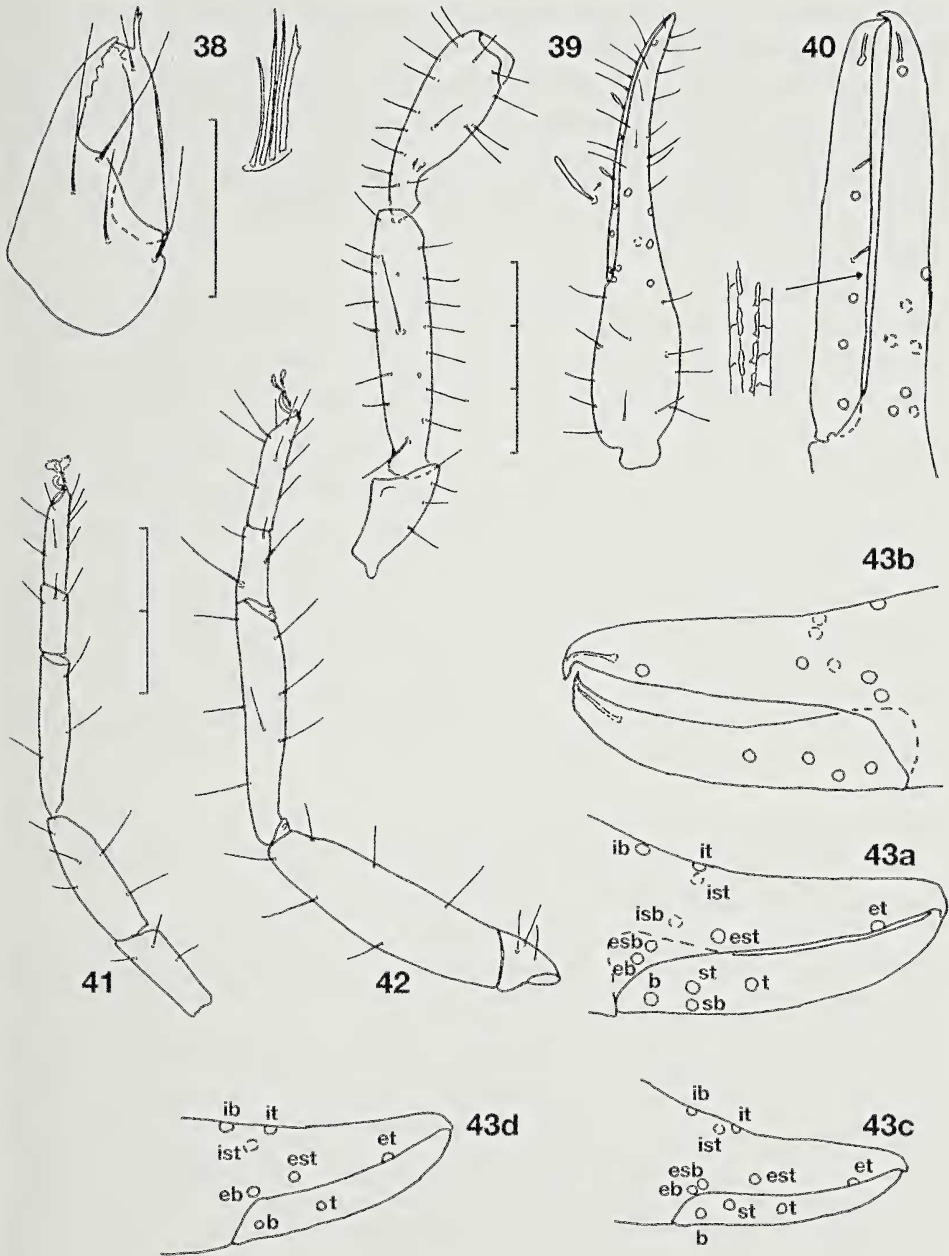
DIAGNOSIS: Chaetotaxy of half-tergites: I-II 1, III-VII 2; pedipalps: femur with 2 dorsal tactile setae, 4.8 times longer than broad (length 0.41 mm), patella 2.9 times, club 2.0 times, hand with pedicel 2.1 times longer than broad, finger 1.5 times longer than hand with pedicel, chela with pedicel 5.2 times, without pedicel 4.9 times longer than broad; leg arolia deeply divided, distinctly longer than smooth claws.

DESCRIPTION: Carapace and pedipalps yellowish brown, tergites broadly divided (separation indistinct due to feeble sclerotization), sternites undivided. Carapace 1.7 times longer than broad, without transverse furrow, anterior margin rounded, posterior margin desclerotized, 4 large eyes, posterior eye close to anterior one, chaetotaxy: 4-4-4-4-2; chaetotaxy of half-tergites: I-II 1, III-VII 2, VIII-IX 3, X 3/4 (1 lateral, 1 submedial tactile seta), XI (total) 7 (4 tactile setae); pleural membranes finely striate, without setae. Manducatory process with 2 marginal setae (one suboral seta), pedipalpal coxa itself smooth, 6 setae, coxae I-II 4, III-IV 3, genital operculum with 4 (2-2) median marginal setae; chaetotaxy of sternites IV-XI: 4 + 1 suprastigmal seta each-4+2x1-3-6-6-5-7 (2 lateral and 2 submedial tactile setae)-4 (3 tactile setae), on VI-VIII 2 discal glandular setae in the middle.

Chelicera (Fig. 38) with 4 long, smooth setae on hand, fixed finger with 3 retrorse teeth and two subapical granula, movable finger with a small, two-pointed(?) lobe, a narrow and indistinct lamina exterior present, subgaleal seta short, not reaching end of galea, galea slender, with 2 apical branchlets, serrula exterior with 16 lamellae, rallum with 4 setae (distal seta with 1 tooth).

Pedipalps (Figs 39-40) smooth, trochanter with small dorsal hump, femur with 2 dorsal tactile setae, 4.8 times longer than broad, patella 2.9 times, club 2.0 times, hand with pedicel 2.1 times longer than broad, finger 1.5 times longer than hand with pedicel, chela with pedicel 5.2 times, without pedicel 4.9 times longer than broad; fixed finger with 32 broad, slightly pointed teeth, movable finger with 23 broad and flattened teeth (only 8 distal ones with small cusp); trichobothria (Fig. 40): 7 placed in basal half on fixed finger, only *et* near finger end, *st* of movable finger distinctly distal to *sb*, which is indistinctly nearer to *st* than to *b*; venom duct very short, several modified setae on fixed and movable finger.

Leg I (Fig. 41): femur 2.6 times longer than deep, patella 3.1 times longer than deep and 1.3 times longer than femur, tibia 5.65 times, basitarsus 2.8 times, telotarsus 4.1 times longer than deep, telotarsus 1.3 times longer than basitarsus; leg IV (Fig. 42): femur+patella 4.5 times longer than deep, tibia 6.3 times, basitarsus 2.5 times, telotarsus 4.3 times longer than deep and 1.5 times longer than basitarsus, basitarsus with



FIGS 38-43

Serianus elongatus sp. n., ♀ holotype (38-42), *S. galapagoensis* Beier, 1978 (43). (38) Right chelicera, with rallum enlarged. (39) Left pedipalp. (40) Trichobothrial pattern. (41) Leg I. (42) Leg IV. (43) Trichobothrial pattern of ♂ (right chela) (a), of ♂ (left chela) (from Pinta) (b), of tritonymph (c), of deutonymph (d). Scale units 0.1 mm.

a basal tactile seta (TS=0.26), chaetotaxy: TS+1/1/1; arolia divided, distinctly longer than smooth claws, divided at level of claw end.

MEASUREMENTS: Total length 2.17. Carapace 0.45/0.27. Pedipalps: trochanter 0.20/0.09, femur 0.41/0.09, patella 0.31/0.11, pedicel 0.09, hand with pedicel 0.28/0.14, pedicel 0.03, finger-length 0.43, chelal length with pedicel 0.70. Leg I: femur 0.13/0.05, patella 0.17/0.06, tibia 0.20/0.04, basitarsus 0.09/0.03, telotarsus 0.11/0.03; leg IV: femur+patella 0.39/0.09, tibia 0.30/0.05, basitarsus 0.09/0.04, telotarsus 0.14/0.03.

REMARKS: 18 species of this genus are recorded mainly from northern and southern America, but also from Algeria (1), Iran (1) and the Solomon Islands (1). The new species differs from all other species of the genus by its slender pedipalps (e.g. pedipalpal femur more than 4.5 times, chela with pedicel more than 5.0 times longer than broad) and legs (e.g. femur+patella of leg IV 4.5 times longer than deep). Its trichobothrial pattern is also particular within the genus, trichobothrium *it* being placed half-way between *ist* and *est*, which is near the middle of the fixed finger, trichobothrium *st* being distinctly distal of *sb* (as opposed to lying above *sb*) on the movable finger. Differential characters are summarized in the identification key.

The position of *st*, above or distal to *sb*, was tentatively used by Mahnert (1988) to separate the genera *Garypinus* Daday, 1888 and *Serianus* Chamberlin, 1930, but this was subsequently found to be unreliable as a generic character since it shows some variability, even in a single individual (e.g. in *Serianus galapagoensis*).

The new species might represent an element of the fauna of lava tubes or of the mesovoid shallow substratum (MSS).

Serianus galapagoensis Beier, 1978

Fig. 43

Serianus galapagoensis Beier, 1978: 536-538, fig. 3 (type locality: Santa Fé, Landebucht, Vegetation über dem Strand).

Serianus pusillimus (not Beier, 1959): Beier, 1978: 536 - misidentification.

SPECIMENS STUDIED: **Champion** NE Floreana: 1 ♀ 1P; arid zone, litter sifting, cactus, 22.IV.1992, leg. S. Peck (92-136). – **Espanola**: 39329; 3 ♀; "100 m Hill", 90 m, under lava slabs in lava sand, *Bursera-Cordia-Prosopis-Lantana* assoc., 8.II.1977, leg. W. G. Reeder. – 39303; 1 ♂ 2 ♀ 1T; Punta Cevallos camp beach berm, 2 km W of Punta Cevallos, screened from litter of *Prosopis* and *Vallesia*, 8.II.1977, leg. W. G. Reeder. – 39325; 1 ♂; Punta Cevallos area, radar site, 100 m, screened from old finch nest in dead *Prosopis*, 9.II.1977, leg. W. G. Reeder. – RBINS; 1 ♂; Punto Cevallos, zone còtière, 0-5 m, 3.III.1988, leg. L. Baert, J.-L. Maelfait & K. Desender (B.88/358). – 39300; 1 ♂; 3 km from Punta Cevallos, 30 m, single *Bursera* on rock outcrop, with *Lantana* and *Prosopis*, from *Bursera* litter, 11.II.1977, leg. W. G. Reeder. – 39434; 1 ♀; 3 km N of Punta Cevallos, 25 m, screening of old finch nest in *Opuntia*, *Lantana*, *Prosopis*, 11.II.1977, leg. W. G. Reeder. – 1 ♀; Bahía Manzanillo, *Prosopis* grove behind beach, dung trap, 8.-10.V.1985, leg. S. & J. Peck (85-184). – 1T; same locality, carrion traps, 5.-10.VI.1985, leg. S. & J. Peck (85-185). – 1 ♀; Bahía Manzanillo, 5 m, arid zone, FIT, 23.IV.-2.V.1992, leg. S. Peck (92-146). – 12 ♂ 12 ♀ 3T 4D 3P; Punta Suarez, 10 m, litter under bushes in seabird rookery, 10.VI.1985, leg. S. & J. Peck (85-187). – 2 ♀ 2P; Punta Suarez, near Blow Hole, littoral zone, under *Sesuvium edmonstonei*, well decayed leaf litter, dry to moist and salty, 7.IV.1985, leg. H. & I. Schatz (85-350). – 1 ♀ 1T; Punta Suarez, 30 m, shrub litter, 29.IV.1992, leg. S. Peck (92-144). – 2 ♂ 2 ♀; ridge crest, 125 m, tortoise droppings, 30.IV.1992, leg. S. Peck (92-151); – 1 ♀ 1D; Punta Suarez, 10 m, *Cordia-Cryptocarpus* litter, 2.V.1992, leg. S. Peck (92-152). – **Fernandina**: TNSC 39337; 1 ♂; W slope, 500 m, above base camp crater, under bark of downed *Zanthoxylum* in *Psychotria* shrub; 17.VIII.1977, leg. W. G. Reeder. – MHNG; 2 ♀; Cabo

Hammond, cormorant nests. 29.V.1996, leg. S. Peck (96-208). – **Floreana**: TNSC 39244; 1 ♀; *Loberia*, south of Black Beach, screening litter, 18.II.1979, leg. W. G. Reeder. – RBINS/MHNG; 3 ♂ 1 ♀; Black Beach, *Cryptocarpus* litter, 24.III.1989, leg. S. Peck (89-149). – MHNG; 1 ♂ 2 ♀; 1 km S Black Beach, crevice, litter supralittoral, 23.III.1989, leg. S. Peck (89-157). – 1D; Punta Cormoran, 5 m, leaf litter under *Waltheria ovata*, dry zone, 6.IV.1985, leg. H. & I. Schatz (85-327). – **Gardner** at Espanola: TNSC 39315; 1 ♂; 20 m, under rocks in shade of *Opuntia*, *Bursera-Croton-Cordia* community, litter thin, very dry, 13.II.1977, leg. W. G. Reeder. – 39323; 2 ♂ 2 ♀ 1T; 20 m, litter of large *Opuntia*, *Bursera-Croton-Cordia* community, 13.II.1977, leg. W. G. Reeder. – RBINS; 2 ♀; littoral zone between *Sesuvium*, 24.III.2000, leg. L. Baert, J.-P. Maelfait & K. Desender (B00/059). – 1 ♀; “summit”, dry zone with *Cordia lutea*, *Croton scouleri*, *Bursera graveolens*, *Lantana peduncularis*; grass and leaf litter on red soil, sifted, 30 m; 14.III.1987, leg. H. Schatz (87-H294). – **Gardner** at Floreana: 1 ♂ 2 ♀ 1T 2D; arid zone, litter, 2.V.1992, leg. S. Peck (92-148). – **Genovesa**: 39327; 2 ♂; Bahia Darwin, 15 m, screened from litter of *Cordia lutea* and *Croton*, also beneath small lava rocks in litter (also *Opuntia*, *Bursera*), 22.XII.1975, leg. W. G. Reeder. – 39333, 39347; 2 ♂ 3 ♀; southern rim crater, 65 m, sifting of dry litter of *Bursera* and *Croton*, with *Lantana*, dry rocky substrate, 23.X.1975, leg. W. G. Reeder. – 8 ♂ 2 ♀ 1T 1D; Bahia Darwin, 1 m, back-beach, litter washing, 27.III.1992, leg. J. Cook & S. Peck (92-62). – 1 ♂; Bahia Darwin, 1 m, arid zone, dung trap, 10-25.III.1992, leg. S. Peck (92-11). – 1 ♀; inner of island, in *Chamaesyce*, sifted from dry litter, 14.II.1985, leg. H. & I. Schatz (85-H11). – **Isabela**: 1 ♂; Punta Garcia, W Volcan Darwin, in Aa lava flow at coast awashed spray area, littoral zone, 0 m; in mangrove belt, under *Rhizophora mangle*; algae from rocks, 21.II.1987, leg. H. Schatz (87-698). – 1 ♀; Punta Garcia, west of Volcan Darwin, in Aa-flow at coast, awashed spray area, 0 m, in mangrove belt, under *Laguncularia racemosa*, algae from rocks and pumice, 21.II.1987, leg. H. Schatz (87-699). – **Marchena**: RBINS; 1 ♀; near fumaroles, 21.II.1974, leg. S. Jacquemart (97). – RBINS; 1 ♀; Playa Negra, dry arid zone, 21.II.1974, leg. S. Jacquemart (99). – RBINS; 1D; Playa Negra, border of the sea, 25.II.1974, leg. S. Jacquemart (107). – 39305; 4 ♂ 2 ♀ 2T; SW slope beach camp area, screening of *Waltheria* litter, damp, with lava sand substrate, 25.I.1977, leg. W. G. Reeder. – 39296; 2 ♂; Cabo Espejo, SW slope above beach camp, removed from damp rotten *Bursera* wood, *Bursera-Croton* community, 27.I.1977, leg. W. G. Reeder. – **North Plazas**: 39318; 2 ♀; 5 m, sweeping in *Maytenus* and *Castela*, *Opuntia-Castela-Scutia* association, 20.X.1975, leg. W. G. Reeder. – **Pinta**: RBINS; 2 ♀; transect to top, dry pampa zone, 25 m, 27.II.1974, leg. S. Jacquemart (109). – RBINS; 1 ♂; Eastern transect, *Pisonia* litter, 27.II.1974, leg. S. Jacquemart (117). – 39335; 1 ♂; near South Playa, 20 m, screening of very dry litter of *Cordia* and *Bursera*, substrate dry red lava sand, 22.IV.1977, leg. W. G. Reeder. – **Pinzon**: RBINS; 1 ♂; beach with *Sesuvium*, 20.I.1974, leg. S. Jacquemart (31B; 24965). – 1T; southern slope, Fern Sedge zone, 300 m, under *Croton scouleri*, *Althernathera echinocephala*, *Prosopis juliflora*, *Acacia macracantha*, *Courmelina diffusa*, *Pteridium aquilinum*; fern litter and roots with soil, 3.II.1987, leg. H. Schatz (87-601). – **San Cristobal**: 39367; 1 ♀; Cerro Felado, 450 m, from litter and moss-fern growth, base of lava blocks, soil well-drained, litter thin, *Scalesia-Psychotria-Chiococca-Zanthoxylum* comm., 17.II.1978, leg. W. G. Reeder. – 1T; Baquerizo, 10 m, arid zone FIT, 11.-23.II.1989, leg. S. Peck (89-48). – 5 ♂ 15 ♀ 1P; Baquerizo, 3 km SE, littoral zone, litter under beach plants, 11.II.1989, leg. S. Peck (89-49). – 1 ♂ 1 ♀; Baquerizo, 3 km SE, beachdrift, 12.II.1989, leg. S. Peck (89-54). – 1D; lake El Junco, 670 m, *Miconia* zone, fern litter under *Miconia robinsoniana* and *Pteridium aquilinum*, 28.III.1985, leg. H. & I. Schatz (85-298). – RBINS; 1 ♂; Caleta Sapho, Puerto Grande, 2 m, 24.III.2009, leg. L. Baert, F. Hendrickx & W. Dekoninck (B.09/026). – **Santa Cruz**: 39272; 1 ♂ 1P; transect from Caseta south to coast, 70 m, Quadrat A-2, 23.VIII.1970, leg. W. G. Reeder. – 39290; 1 ♀; transect from Caseta south to coast, 70 m, Quadrat A-4, 23.VIII.1970, leg. W. G. Reeder. – 39292; 1 ♀; transect from Caseta south to coast, 60 m, Quadrat B-3, 23.VIII.1970, leg. W. G. Reeder. – 34100; 2 ♀ 1D; transect from Caseta south to coast, 60 m, Quadrat B-3, 23.III.1970, leg. W. G. Reeder. – 39285; 1 ♀; transect from Caseta south to coast, 60 m, Quadrat A-4, 23.VIII.1970, leg. W. G. Reeder. – 34101; 1 ♀; transect from Caseta south to coast, 40 m, Quadrat A-2, 24.VIII.1970, leg. W. G. Reeder. – 39282; 1 ♀; transect from Caseta south to coast, 40 m, Quadrat D-3, 24.VIII.1970, leg. W. G. Reeder. – 34098; 1 ♂; transect from Caseta south to coast, 30 m, Quadrat C-4, 24.VIII.1970, leg. W. G. Reeder. – 39270; 1T; transect from Caseta south to coast, 30 m, Quadrat D-3, 24.VIII.1970, leg. W. G. Reeder. – 39275; 1 ♀; transect from Caseta south to coast, 30 m, Quadrat A-4, 24.VIII.1970, leg.

W. G. Reeder. – 39288; 1 ♀ 1T; transect from Caseta south to coast, Quadrat E-2, 24.VIII.1970, leg. W. G. Reeder. – RBINS; 3 ♀; Cerro Colorado, 25.V.1975, leg. H. Franz (SA-292). – 1P; near Puntudo, 730 m, under ferns in litter, 7.II.1985, leg. H. & I. Schatz (85-55). – 1P; Cerro Crocker, 860 m, Fern Sedge zone, under *Pteridium aquilinum* ssp. *arachnoideum*, fern litter and pieces of wood, 7.II.1985, leg. H. & I. Schatz (85-113). – 1 ♂; Los Gemelos, 3 km N Santa Rosa, 570 m, *Scalesia* forest litter, 13.VI.1985, leg. S. & J. Peck (85-188a). – 1 ♂; north side, 1 km E Cal. Tortuga Negra, soilwashing, upperbeach, 2.IV.1989, leg. S. Peck (89-189). – 1P; Puerto Ayora, Tortuga Bay, brackish litter under manchineel, 0.5 m, 29.VI.1991, leg. S. Peck (91-258). – 4 ♂ 3 ♀ 3T 1D; south-east, Punta Roca fuerte, arid coast, *Cordia* litter, 7.V.1992, leg. S. Peck (92-161). – RBINS; 2 ♀; CDRS, littoral zone, *Sesuvium*, 1-2 m, 28.II.1982, leg. L. Baert & J.-P. Maelfait (B28.2.2). – RBINS; 1 ♀; road to Itabaca, bush, 23.I.2010, leg. F. Hendrickx & W. Dekoninck (FH10/019). – **Santa Fé**: 39263; 2 ♂ 1 ♂; 400 m SSW of Camp Bay, 40-50 m, screened from litter of *Scalesia helleri* and *Cordia lutea*, blocky talus, base first barranco, 23.I.1979, leg. W. G. Reeder. – 39273; 1 ♀; rock outcrops of second barranco, 1 km SSW of Camp Bay, 100 m, litter of *Cordia* and *Croton*, sheltered but very dry, 24.I.1979, leg. W. G. Reeder. – 39260; 1 ♀; 1.75 km SSW of Camp Bay, 130 m, from *Oryzomys* nest of *Opuntia* fibers under downed *Opuntia* trunk, *Bursera* area, 25.I.1979, leg. W. G. Reeder. – MHNG/RBINS; 1 ♂ 1D; littoral soil wash under *Cryptocarpus*, 5.IV.1989, leg. S. Peck (89-203). – RBINS; 1 ♀ 1D; alt. 30 m, *Scalesia* litter, 5.IV.1989, leg. S. Peck (89-209). – CDRS; 1 ♀; sector turístico, bajo rocas, XI.1990, leg. S. Abedrabbo. – **Santiago**: RBINS; 1 ♂ 1 ♀; highland, 800 m, 6.III.1986, leg. L. Baert, J.-P. Maelfait & K. Desender (B086/063). – **Seymour**: MHNG/RBINS; 1 ♀ 2T; 15 m, litter under bushes in frigatebird rookery, 23.I.1989, leg. S. Peck (89-18). – RBINS/MHNG; 1 ♂ 5T 1D; SW end, litter under littoral shrubs, 1 m, 23.I.1989, leg. S. Peck (89-20). – **South Plazas**: 39271; 1 ♂; under surface lava, 4.III.1970, leg. W. G. Reeder. – 39365; 1T; alt. 2-3 m, under lava stones just above high tide line, below *Sesuvium*, west end of island, heavy use by sea lions; 28.V.1975, leg. W. G. Reeder. – 39262; 3 ♂ 3 ♀; 10-12 m, screening of damp litter under *Opuntia* pad and rotting *Opuntia* stump base, 19.III.1975, leg. W. G. Reeder. – 39278; 1 ♂; 12-15 m, under stones of lava gravel-sand substrate, no litter, 19.III.1975, leg. W. G. Reeder. – MHNG; 9 ♂ 3 ♀ 1T 1D 1P; arid shrubs and succulent litter, 6.V.1992, leg. S. Peck (92-162).

SHORT DESCRIPTION: Chaetotaxy of carapace and tergites as indicated by Beier (1978), without variation. Sternites of ♂: VI with 4-6 median glandular setae (more or less in semi-circular arrangement), VII 4-5 (semi-circular arrangement), VIII 2-3. Chelicera: rallum with 4 setae, distal one dentate on anterior margin, serrula exterior with 16-18 lamellae (1 ♀ with 20, only left chelicerae studied). Pedipalps of ♂ (♀): femur 2.9-3.2 (2.8-3.4) times, patella 2.2-2.5 (2.1-2.6) times, hand with pedicel 1.8-2.1 (1.7-2.1) times, chela with pedicel 3.1-3.6 (3.1-3.4) times, without pedicel 2.8-3.3 (2.8-3.1) times longer than broad, finger in ♂ ♀ 1.2-1.4 times longer than hand with pedicel. Fixed finger (♂ ♀) with 24-30 teeth, movable finger (♂ ♀) with 18-23 teeth; venom ducts very short. Trichobothria: *st* of movable finger normally above *sb*, in one ♂ on left side distinctly distal of *sb*; trichobothrial pattern of ♂, trito- and deutonymph as in Fig. 43 a-d. Leg I: telotarsus 1.4-1.8 (frequently 1.5-1.6) times longer than basitarsus; leg IV of ♂ (♀): femur+patella 2.4-2.7 (2.6-3.1) times, tibia 3.1-3.6 (2.9-4.0) times, basitarsus 1.6-1.8 (1.6-2.2) times, telotarsus 2.4-2.7 (2.2-3.0) times longer than deep; chaetotaxy of basitarsus: TS+1/1/1 (paired). Arolia divided in distal half, much longer than claws.

MEASUREMENTS of 16 ♂ (11 ♀)(specimens from most of the islands): Total length 2.16-2.84 (2.33-3.98). Carapace 0.53-0.68 (sclerotized part)/0.34-0.42 (0.59-0.82/0.35-0.45). Pedipalps: femur 0.41-0.51/0.14-0.16 (0.48-0.62/0.16-0.20), patella 0.41-0.51/0.18-0.23 (0.48-0.61/0.20-0.26), hand with pedicel 0.44-0.56/0.22-0.29

(0.52-0.67/0.28-0.33), length of finger 0.34-0.43 (0.40-0.47), of chela with pedicel 0.77-0.93 (0.89-1.12). Leg IV: femur+patella 0.41-0.49/0.16-0.19 (0.47-0.63/0.17-0.23), tibia 0.29-0.36/0.08-0.11 (0.33-0.43/0.10-0.15), basitarsus 0.09-0.10/0.05-0.06 (0.10-0.14/0.06-0.07), telotarsus 0.12-0.13/0.04-0.05 (0.12-0.16/0.05-0.06).

REMARKS: The specimens from the island of Pinta (NHMW 22819, 1♂ 1♀ examined), identified by Beier (1978) as *S. pusillimus*, belong without doubt to *S. galapagoensis*; Beier's statements on their tergal chaetotaxy (tergite I and II with 4 setae, III-IX with 6 marginal setae) are due to a mistake: chaetotaxy of tergites I-VI of both specimens is 4-4-4-4-4-6. *Serianus galapagoensis* is one of the most common species on the archipelago, being present on most of the sampled islands. It occurs from the littoral zone up to an altitude of 860 m, in moist to arid habitats, mostly in litter, but was also collected in flying insect traps and in nests of various bird species which probably facilitate its dispersal within the archipelago.

Nymphal stages of *Serianus galapagoensis* (and other *Serianus* species) and of the widely distributed *Galapagodinus franzi* may be differentiated as follows: tritonymphs are separated by presence/absence of trichobothrium *est*; deutonymphs are clearly separated by the trichobothrial pattern (6+2 trichobothria on chelal fingers in *S. galapagoensis*, 5+1 in *G. franzi*), and also in the shape of the galea (apical fork and lateral branch much longer in *G. franzi* than in *S. galapagoensis*); protonymphs can be separated by the shape of the galea.

Serianus cf. *galapagoensis* Beier, 1978

SPECIMEN STUDIED: **Baltra**: MHNG; 1♂; leg. Y. Mumcuoglu (Basle), IV. 1977. — **Sombbrero Chino**: 1♀; northern part, littoral zone, 10 m, under *Sesuvium edmonstonei*, decayed leaf litter and red soil, 21.II.1987, leg. H. Schatz (87-684).

SHORT DESCRIPTION: Carapace 1.5 times as long as broad (0.60 mm/0.40 mm), with an indistinct transverse furrow (band?), with 22 setae (5/7/4/2/4); tergal chaetotaxy: 4/5/6/5/5/8/7/7/8/8/ (4 tactile setae)/8 (4 tactile setae). Sternal chaetotaxy III-XI: 6+2/2 suprastigmal setae/6+2x1 suprastigmal setae/8/8/6/6/8/10 (4 tactile setae)/8 (4 tactile setae), sternites VI and VII with 3 median glandular setae each, VIII with 2 glandular setae. Chelicera: 5 long, smooth setae on hand, galea of movable finger long, with short apical fork and a thin lateral branch proximal of middle; serrula exterior with 17 lamellae, rallum with 4 setae, the basal one distinctly shortest. Pedipalps: femur smooth, with a dorsal tactile seta (TS=0.44), 3.2 times longer than broad (0.51 mm/0.16 mm), patella smooth, 2.4 times (0.50/0.21), hand with pedicel 1.7 times longer than broad (0.51/0.39) and 1.14 times longer than finger, chela with pedicel 3.0 times longer than broad, length of finger 0.45 mm, length of chela 0.94 mm; fixed finger with 25 acute teeth, movable finger with 19 teeth (distal 9 acute); venom ducts very short, trichobothrial pattern as in *S. galapagoensis*. Leg I: femur 1.4 times longer than deep (0.13/0.09), patella 1.9 times longer than deep (0.21/0.11) and 1.55 times longer than femur, tibia 3.8 times longer than deep (0.26/0.07), basifemur 2.0 times (0.09/0.05), telotarsus 2.7 times longer than deep (0.11/0.04) and 1.2 times longer than basitarsus. Leg IV: femur+patella 2.8 times longer than deep (0.49/0.18), tibia 3.5 times (0.36/0.10), a tactile seta in proximal third (TS=0.30), basitarsus 2.0 times (0.12/0.06), telotarsus 2.9 times longer than deep (0.16/0.05), basitarsus with a basal

tactile seta (TS= 0.16), telotarsus 1.3 times longer than basitarsus. Arolia and claws as in *galapagoensis*.

The specimen from Baltra shows also an divergent tergal chaetotaxy (tergites I-VI 6-5-6-6-6-8..), the morphological and morphometric values are within the variability range of those of *S. galapagoensis*.

REMARKS: These specimens show an irregular, asymmetrical tergal chaetotaxy (particularly on tergites III-V), and are, for this reason, separated from typical *S. galapagoensis* (no such variation has been observed on the numerous specimens examined). No other morphological differences are evident.

Serianus maritimus sp. n.

Figs 44-48

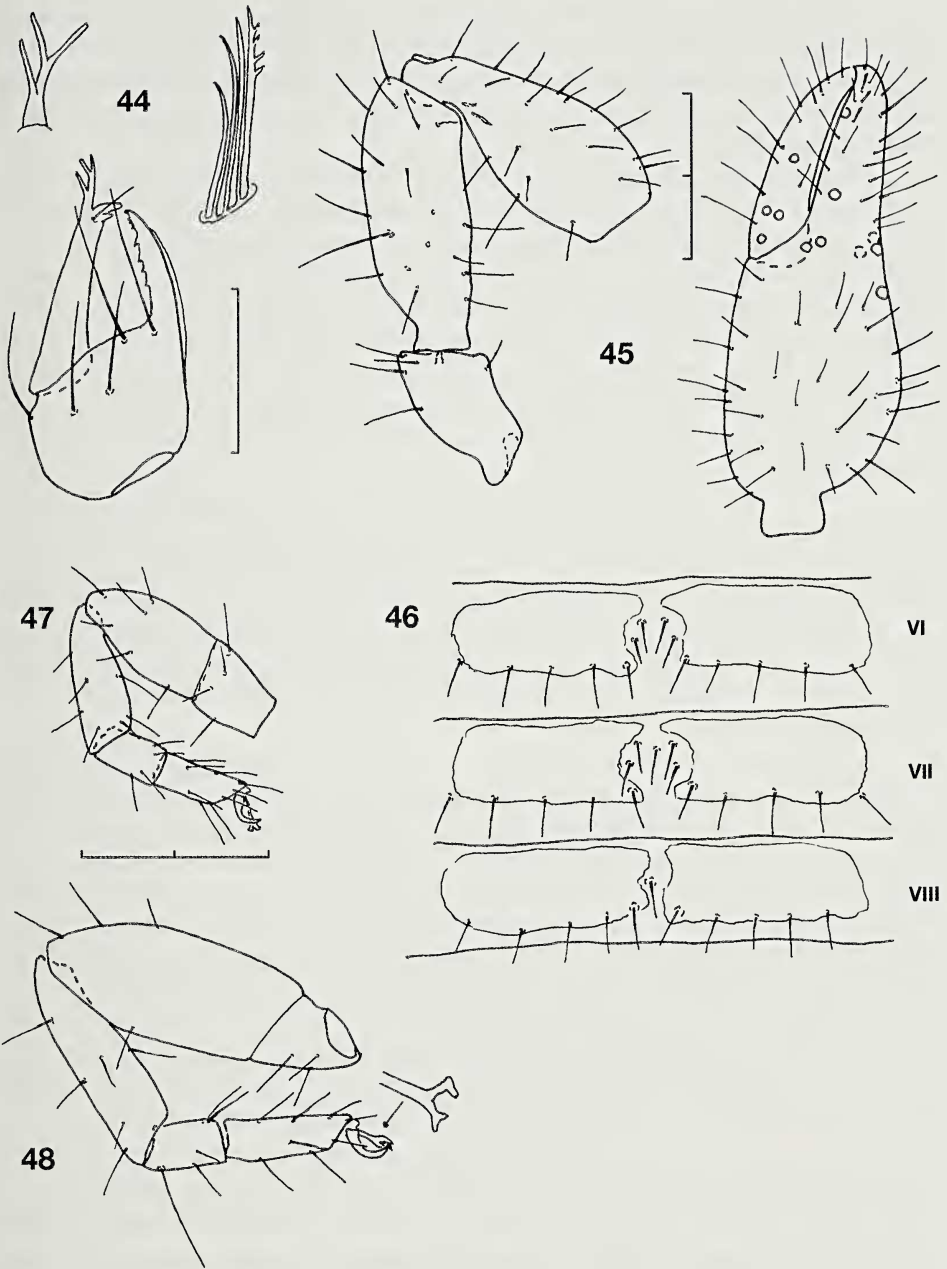
HOLOTYPE: MHNG; ♂; **Fernandina**: Cabo Hammond, sea cliff spraying, 5.IV.1996, leg. S. Peck (96-207).

PARATYPES: **Fernandina**: MHNG; 1 ♀; Cabo Hammond, sea cliff spraying, 5.IV.1996, leg. S. Peck (96-207). – **Pinta**: MHNG; 5 ♂ 7 ♀ 2T; Cabo Ibbetson, sea cliff spraying, 16.III.1992, leg. S. Peck & J. Cook (92-49). – **San Cristobal**: MHNG; 1 ♂; 3 km N Wreck Bay, Cerro Tijeritas, 0 m, sea cliff spraying, 20.III.1996, leg. S. Peck (96-38). – **Santa Cruz**: MHNG; 2 ♂; 16 km E CDRS, 1 m, littoral, sea cliff spraying, 9.VI.1996, leg. S. Peck (96-168). – **Santa Fé**: MHNG; 2 ♂; sea cliff spraying, 5.IV.1989, leg. S. Peck (89-182). – **Isla Wolf**: MHNG; 1 ♀; arid zone, 75 m, *Croton* forest, hand collecting, 11.V.1996, leg. S. Peck (96-171).

ETYMOLOGY: Latin adjective means “belonging to the sea” or “of the sea”.

DIAGNOSIS: Chaetotaxy of half-tergites I 3-4 (1 ♂ 2/3, 1 ♂ 2/2), II 3-4 (1 ♂ 2/2, 1 ♂ 2/3), III 3-4, IV-X 5-6 (rarely 4), femur with a dorsal tactile seta proximal of middle, 2.7-3.2 times longer than broad (length 0.33-0.45 mm), patella 2.2-2.5 times, club 1.6-1.9 times, hand with pedicel 1.7-6 times, chela with pedicel 2.8-3.1 times, without pedicel 2.6-2.9 times longer than broad, finger 1.2-1.3 times longer than hand with pedicel and 1.27-1.46 times longer than breadth of hand; arolia divided in distal third, indistinctly longer than smooth claws.

DESCRIPTION OF ADULTS: Carapace and pedipalps reddish brown, tergites brown. Carapace with a median transverse furrow, posterior margin distinctly rounded, with a unsclerotized basal zone, 4 large corneate eyes, anterior eyes about half their diameter from anterior margin, 18 setae (4/6/4/4). Tergites I-VII small (partly indistinctly divided), VIII-IX partly divided, XI undivided; chaetotaxy of half-tergites I 3-4 (1 ♂ 2/3, 1 ♂ 2/2), II 3-4 (1 ♂ 2/2, 1 ♂ 2/3), III 3-4, IV-X 5-6 (rarely 4), tergite XI 7-9 (4 tactile setae); manducatory process with 2 marginal and 1 discal setae; pedipalpal coxa itself normally with 7 (up to 9) setae, coxa I 3-6, II 5-6, III 4-5, IV 4-5. Anterior genital operculum with 8-9 central marginal setae, lateral genital sacs (♂) with short enlarged apical part, median sac not observed, ♀ with a small, irregularly shaped median cribrate plate, distinctly smaller lateral cribrate plates oval; sternites entirely or partly divided, X/XI mostly undivided; chaetotaxy of half-sternites III/IV 3-4+3 suprastigmal setae/3-4+1 suprastigmal seta, V-X mainly 4-6, XI (total) 7-8 (4 tactile setae); ♂ (Fig. 46): sternite VI in middle with 4-6 glandular setae (arranged frequently nearly in a transverse row), VII 4-7 (semi-circular arrangement), VIII 0-4; ♀: VI-VII(VIII) with a pair of discal and slightly modified (glandular?) setae; anal cone 2+2. Pleural membrane finely striate, without setae.



FIGS 44-48

Serianus maritimus sp. n., ♂ holotype (unless indicated otherwise). (44) Right chelicera of ♀, with galea and rallum enlarged. (45). Left pedipalp. (46) Sternites VI-VIII. (47) Left leg I. (48) Left leg IV. Scale unit 0.1 mm.

Chelicera (Fig. 44): hand with 5 long setae, fixed finger with 4-5 retrorse teeth and 1-2 subapical granula, lamina exterior very small; movable finger with a broad tooth-like subapical lobe, galea with a long apical fork and one long lateral branch near middle; serrula exterior with 18-19 lamellae, rallum with 4 setae, distal one dentate, basal one shorter.

Pedipalps (Fig. 45) smooth, femur with a dorsal tactile seta proximal of middle, 2.7-3.2 times longer than broad, patella 2.2-2.5 times, club 1.6-1.9 times, hand with pedicel 1.7-1.8 times, chela with pedicel 2.8-3.1 times, without pedicel 2.6-2.9 times longer than broad, finger 1.2-1.3 times longer than hand with pedicel and 1.27-1.46 times longer than breadth of hand; fixed finger with 16-21 acute teeth (a few basal ones larger and rounded), 4-5 modified sensory setae near trichobothrium *et*, movable finger with 15-20 teeth (a few basal ones rounded), venom ducts very short; trichobothria (Fig. 45): *ib* on distal dorsum of hand, *ib/isb/ist* closely grouped at level of *eb/esb*, only *et* in distal half of finger; trichobothrium *st* above or indistinctly proximal to *sb* on movable finger.

Leg I (Fig. 47): femur 1.3-1.5 times, patella 1.7-2.2 longer than deep and 1.6-1.8 times longer than femur, suture between them oblique; tibia 3.0-3.6 times, basitarsus 1.6-1.8 times, telotarsus 2.5-3.1 times longer than deep, telotarsus 1.4-1.6 times longer than basitarsus; leg IV: femur+patella 2.9-3.1 (δ) (♀ : 3.1-3.4) times, tibia 3.8-4.2 times, basitarsus 1.9-2.1 times, telotarsus 3.0-3.6 times longer than deep, telotarsus 1.3-1.5 times longer than basitarsus, basitarsus with one basal tactile seta (TS=0.18-0.27), chaetotaxy: TS+1/1/1 (paired), arolia divided in distal third, indistinctly longer than smooth claws.

MEASUREMENTS of 6 δ (Fernandina, Pinta, San Cristobal, Santa Cruz, Santa Fe) (4 ♀ ; Fernandina, Pinta, Wolf): Total length 1.8-2.0 (2.0-2.5). Carapace: 0.45-0.55/0.32-0.36 (0.49-0.53/0.34-0.39). Pedipalps: trochanter 0.19-0.22/0.11-0.12 (0.20-0.25/0.11-0.12), femur 0.33-0.41/0.12-0.14 (0.33-0.45/0.11-0.15), patella 0.33-0.39/0.14-0.17 (0.33-0.44/0.14-0.17), hand with pedicel 0.33-0.41/0.19-0.24 (0.33-0.43/0.19-0.25), length of pedicel 0.04-0.06 (0.05-0.08), of finger 0.26-0.31 (0.25-0.33), of chela with pedicel 0.57-0.69 (0.56-0.74). Leg I: femur 0.08-0.11/0.06-0.07 (0.08-0.11/0.07), patella 0.14-0.17/0.07-0.08 (0.13-0.18/0.08-0.09), tibia 0.15-0.18/0.05-0.06 (0.15-0.21/0.04-0.06), basitarsus 0.07-0.08/0.04 (0.07-0.08/0.04-0.05), telotarsus 0.10-0.12/0.04 (0.09-0.12/0.04-0.05); leg IV: femur+patella 0.33-0.41/0.11-0.14 (0.34-0.45/0.11-0.14), tibia 0.24-0.29/0.07-0.08 (0.23-0.31/0.06-0.08), basitarsus 0.09-0.10/0.05 (0.09-0.11/0.05), telotarsus 0.12-0.15/0.04 (0.13-0.16/0.04-0.05).

DESCRIPTION OF TRITONYMPH: Similar to adults in most morphological characters; chaetotaxy of half-tergites: I-III 3, IV-X 4-5; sternites VI-VIII with a median pair of thinner discal setae; femur 2.9 times (0.33/0.12), patella 2.4 times (0.33/0.14), hand with pedicel 1.6 times (0.33/0.20), chela with pedicel 2.9 times, without pedicel 2.7 times longer than broad, length of pedicel of hand 0.04 mm, of finger 0.28 mm, of chela with pedicel 0.59 mm. Leg IV: femur+patella 2.9 times (0.34/0.12), tibia 3.4 times (0.24/0.07), basitarsus 1.9 times (0.09/0.05), telotarsus 0.12/0.04) times longer than deep.

REMARKS: *Serianus maritimus* sp. n. is related to the species possessing on the male sternites VI-VII a group of 4 or more modified glandular setae. It belongs to a

group of small-sized species (length of pedipalpal femur about 0.35-0.40 mm), which possess a long apically forked galea with a long lateral branch near the middle, which have most of the trichobothria placed near the base of the fixed chelal finger, and in which trichobothrium *ib* is even placed on the hand dorsum: *S. carolinensis* Muchmore, 1968 from North Carolina and Florida, USA, *S. minutus* (Banks, 1908) from Texas, USA, *S. dolosus* Hoff, 1956 from New Mexico, USA, and perhaps also *S. gratus* Hoff, 1964 from Jamaica, Belize and Florida (USA). The new species differs from all other *Serianus* species by the short arolia which are barely longer than the claws, whereas in other species the arolia are about twice as long as the claws; furthermore the arolia of the new species are only divided for about one third of their length, whereas in other species they are divided for about half their total length. *Serianus maritimus* sp. n. can furthermore be distinguished from the other species recorded from the Galapagos archipelago by the higher number of marginal setae on tergites I/II (normally 3 vs. 1-2) and on the following ones (3-5 vs. 2-3), and by its small size (length of femur 0.33-0.41 mm vs. 0.40-0.62 mm; length of chela 0.56-0.77 mm vs. 0.77-1.12 mm).

This species inhabits almost exclusively the tidal zone (except the specimen collected on Isla Wolf) and can be considered as halophile. The two specimens from Fernandina are slightly smaller than the other specimens (length of femur 0.33 mm (♂ ♀) vs. 0.36-0.41 mm (♂) or 0.43-0.45 mm (♀)), but these differences might not be significant in view of the small number of specimens examined.

GARYPIDAE

Garypus granosus sp. n.

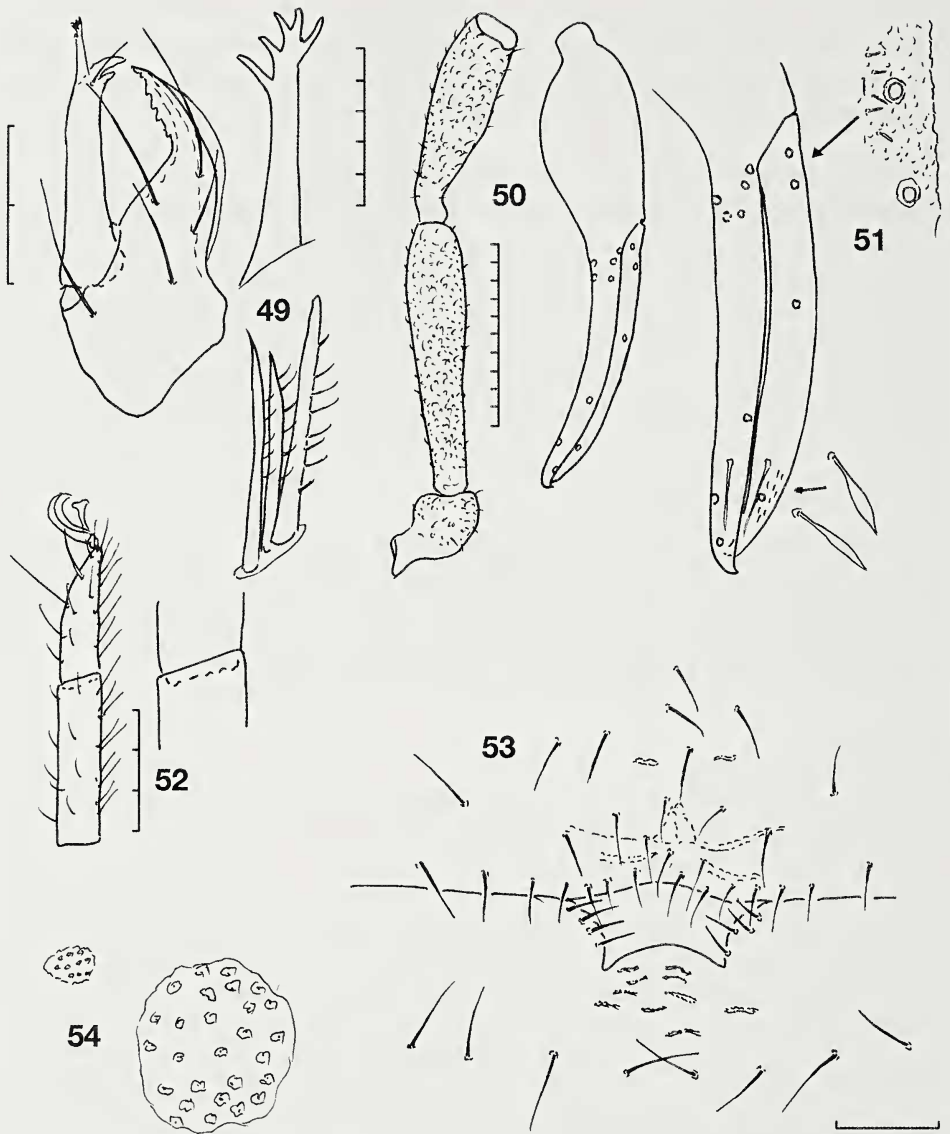
Figs 49-54

HOLOTYPE: **MHNG**; ♂; **Santa Cruz**: Bahia Tortuga (laguna), sol sablonneux, 14.III.1986, leg L. Baert, J.-P. Maelfait & K. Desender (B.86/112)

PARATYPES: **Fernandina**: MHNG; 6♂ 17♀ 10T 2D; Cabo Hammond, 1 m, sea cliff spraying, 12.V.1991, leg. S. & J. Peck (91-131). – MHNG; 1♀ 1T; Cabo Hammond, sea cliff spraying, 5.IV.1996, leg. S. Peck (96-207). – **Isabela**: MHNG; 1♀; Volcan Alcedo, littoral, 1-3.V.1996, leg. S. Peck (96-77). – MHNG; 2♂ 1T; Villamil, spraying intertidal rocks, 6.III.1989, leg. S. Peck (89-106). – **Pinta**: MHNG; 3♂ 2D 3P; Cabo Ibbetson, sea cliff spraying, 16.III.1992, leg. S. Peck & J. Cook (92-49). – **Rabida**: MHNG; 2♂ 1♀ 1T; NE coast, 1 m, sea cliff spraying, 10.VI.1991, leg. S. Peck (91-223). – **San Cristobal**: MHNG; 6♂ 10♀ 15T 4D; 3 km N Wreck Bay, Cerro Tijeritas, 0 m, sea cliff spraying, 20.III.1996, leg. S. Peck (96-38). – **Santa Cruz**: RBINS/MHNG (2♂ 3♀); 7♂ 11♀; Bahia Tortuga (laguna), sol sablonneux, 14.III.1986, leg L. Baert, J.-P. Maelfait & K. Desender (B.86/112). – MHNG; 3♂ 1♀ 2T; 16 km E CDRS, 1 m, littoral, sea cliff spraying, 9.VI.1996, leg. S. Peck (96-168). – **Santa Fé**: MHNG; 1♂ 1T; sea cliff spraying, 5.IV.1989, leg. S. Peck (89-182).

ETYMOLOGY: From the Latin adjective *granosus*, meaning “possessing many grains” or “full of grains”.

DIAGNOSIS (based on specimens from Santa Cruz): Member of the group of species having the tarsal articulation transverse on leg IV, or nearly so (Lee, 1979); metazone of carapace and tergites with reticulated sculpture and tiny, sharp granula as part of the exocuticle; pleural membrane without setae; rallum with 3 setae; 3 trichobothria in distal half of fixed finger, *it* much nearer to *et* than to *est*; on movable finger *st* distinctly nearer to *sb* than to *t*; pedipalps slender, femur 4.7-5.6 times (♀ 4.6-5.0) (length 1.43-1.54/♀ 1.55-1.67 mm), patella 3.7-4.0 (♀ 4.0-4.3) times (1.21-1.27/♀



FIGS 49-54

Garypus granosus sp. n., ♂ holotype (unless indicated otherwise). (49) Right chelicera, with galea (total scale 0.05 mm) and rallum enlarged. (50) Left pedipalp, granulation and setae of chela omitted. (51) Trichobothrial pattern. (52) Basi-/telotarsus IV, with suture region enlarged. (53) Sternites II/III. (54) Median and right lateral cribrate plates of ♀. Scale units 0.1 mm, unless indicated otherwise.

1.24-1.37 mm), chela with pedicel 4.6-4.9 (♀ 4.0-4.3) times (2.45-2.67/♀ 2.66-2.85 mm) longer than broad.

DESCRIPTION OF ADULTS: Carapace and tergites brown, carapace along the sub-basal transverse furrow lighter than the adjacent areas, pedipalps yellowish brown,

chela indistinctly darker than other segments. Carapace 1.2-1.3 times longer than broad, 4 large eyes present, longitudinal depression of cucullus reaching to posterior eyes, median transverse furrow only laterally distinguishable, subbasal transverse furrow distinct, between subbasal furrow and posterior margin a darker zone due to presence of sharp dark granula, the transverse furrow reticulated and with tiny, rasp-like granula, setae short and smooth, 4 + 1/1 preocular setae on anterior and 6 on posterior margin. Tergites I and XI entire, II incompletely divided, III-X divided, I with dark posterior margin, the following ones along posterior margin with light zone, their anterior surface reticulated with sharp tiny granula, posterior half-tergites partly ctenoid-scaly sculptured. Half-tergites I-III with 3-4 (♀ 2-3) short marginal setae, IV-X with 4-5, VII-X with a supplementary lateral anterior seta, XI 8-9 (2 discal setae); manducatory process basally granular, 3 marginal and 1 discal setae, pedipalpal coxa itself granular, about 13-19 setae (1 tactile seta), coxa I 7-11, II 8-10, III 10-14, IV 12-15 (♀ 15-23); anterior genital operculum (♂) with a median concave margin, about 27-30 discal and marginal setae, that of ♀ with about 15-16 medial marginal and discal setae (Fig. 53); male genital opening with 4-5/4-5 internal setae, genital organ: lateral sacs with terminal enlargement, ♀ with a large median cribrate and small lateral plates (Fig. 54), sternite III with several slit-organs behind genital opening, half-sternite III 4-5 setae, IV 4-5, suprastigmal setae absent, V-X mainly 4-5, VIII-X with a supplementary lateral seta, XI 2-4. Pleural membranes with star-like granula. Anal cone 2+2 setae.

Chelicera (Fig. 49): palm with 5 long smooth setae, fixed finger with 4 retrorse teeth and 2 subapical granula, movable finger with a cone-like subapical tooth, subapical seta short; galea slender, with 3 apical and 2-3 subapical branchlets; rallum with 3 serrate setae, serrula exterior with 24-26, serrula interior with 20-22 lamellae.

Pedipalps of ♂ (♀) (Figs 50-51): densely and finely granular, trochanter with a broad dorsal hump, 1.7-1.8 (1.7-1.9) times longer than broad, femur 4.7-5.6 (4.6-5.0) times, patella 3.7-4.0 (3.5-3.7) times, hand with pedicel 2.0-2.1 (1.8-1.9) times, chela with pedicel 4.6-4.9 (4.0-4.3) times, without pedicel 4.4-4.7 (3.8-4.1) times longer than broad, fingers not gaping, 1.3-1.5 (1.4) times longer than hand with pedicel; entire fixed finger and basal two-thirds of movable finger granular; fixed finger with 84-98 (86-90), movable finger with 74-86 (75-79) teeth (broader and lower than those of fixed finger); movable finger with a row of about 11-21 lanceolate setae near trichobothrium *t*, 5-8 stout microsetae near *b* (Fig. 51). Trichobothria (Fig. 51): fixed finger with a basal group of 5 trichobothria, in distal half *est*, *it* and *et*, *it* distinctly nearer to *et* than to *est*; movable finger with *st* in proximal half, nearer to *sb* than to *t*. Short venom ducts present in both fingers, nodus ramosus proximal of *t* or *it*.

Leg I: femur 3.5-4.1 (3.6-3.9) times longer than deep and 1.6-1.7 (♂ ♀) times longer than patella, patella 2.1-2.4 (2.2-2.3) times, tibia 4.1-4.5 (4.2-4.6) times, basitarsus 3.6-3.9 (3.4-3.7) times, telotarsus 3.7-4.5 (3.9-4.1) times longer than deep; basitarsus 1.0-1.1 (♂ ♀) times longer than telotarsus; leg IV (Fig. 52): femur+patella finely granular, 4.1-4.9 (4.3-4.9) times, tibia 6.2-6.8 (6.1-7.0) times, basitarsus 3.7-4.2 (3.4-3.7) times, telotarsus 3.4-4.5 (3.9-4.1) times longer than deep, basitarsus 1.1-1.3 (♂ ♀) times longer than telotarsus, tarsal articulation transverse or nearly so; smooth claws longer than the simple arolium.

MEASUREMENTS of 4 ♂ (3 ♀) (Santa Cruz): Total length 3.9-4.5 (4.5-5.5). Carapace 1.12-1.17/0.91-1.16 (1.21-1.33/1.03-1.05). Pedipalps: trochanter 0.60-0.62/0.33-0.36 (0.64-0.67/0.36-0.40), femur 1.43-1.54/0.30-0.31 (1.55-1.67/0.32-0.34), patella 1.21-1.27/0.31-0.33 (1.24-1.37/0.35-0.37), hand with pedicel 1.11-1.13/0.53-0.57 (1.17-1.28/0.62-0.69), length of pedicel 0.14-0.15 (0.17-0.18), of finger 1.44-1.68 (1.60-1.75), of chela with pedicel 2.45-2.67 (2.66-2.85). Leg I: femur 0.57-0.61/0.15-0.17 (0.63-0.70/0.17-0.18), patella 0.35-0.37/0.15-0.17 (0.39-0.41/0.17-0.18), tibia 0.48-0.51/0.11-0.12 (0.51-0.55/0.12), basitarsus 0.33-0.35/0.09 (0.34-0.38/0.10), telotarsus 0.31-0.34/0.07-0.09 (0.34/0.08-0.09); leg IV: femur+patella 1.17-1.23/0.24-0.28 (1.24-1.37/0.26-0.30), tibia 0.86-0.88/0.13-0.14 (0.91-0.99/0.13-0.15), basitarsus 0.40-0.45/0.11 (0.47-0.48/0.11-0.12), telotarsus 0.35-0.38/0.10-0.11 (0.38-0.39/0.11-0.12).

Specimens from the islands of Pinta and Rabida (5 ♂ 1 ♀ examined in detail) are similar in proportions and measurements to those from Santa Cruz, but have a higher number of internal setae of the genital opening (8-12 on each side), 19-24 (1 ♂ with 9) lanceolate setae on the movable chelal finger near trichobothrium *t* and 27-30 lamellae in the serrula exterior. One male from Rabida was slightly smaller than those from Santa Cruz: pedipalpal femur 1.33/0.28 mm, patella 1.09/0.29, hand with pedicel 0.98/0.52, length of chela 2.38, finger 1.48 mm.

San Cristobal (2 ♂ 1 ♀): Serrula exterior of chelicera with 28 lamellae; ♂ genital opening with 7/8 internal setae; pedipalps: femur 4.9-5.1 (♀ 4.9) times (1.54-1.58 mm/0.31-0.32 mm; ♀ 1.92/0.39), patella 3.8-4.2 (♀ 3.7) times (1.26-1.34/0.32-0.33; ♀ 1.52/0.41), hand with pedicel 2.1-2.2 (♀ 1.60) times (1.13-1.17/0.53-0.54; ♀ 1.32/0.82), chela with pedicel 4.9-5.3 (♀ 4.10) times (length 2.67-2.81 mm; ♀ 3.38), without pedicel 5.1 (♀ 3.90) times (length 2.70; ♀ 3.21 mm); length of finger 1.60-1.75 (♀ 2.20) mm. These proportions probably fall within the range of intraspecific variability.

Specimens from Santa Fé (1 ♂), Fernandina (1 ♂ 4 ♀) and Isabela (1 ♀) are distinctly smaller than those from other islands, but of identical proportions. Serrula exterior of chelicera with 25-27 lamellae. Pedipalps: femur 4.2-4.5 (♀ 4.0-4.4) times (1.13-1.28/0.27-0.28; ♀ 1.14-1.23/0.28-0.29), patella 3.4-3.6 (♀ 3.1-3.4) times (0.96-1.07/0.28-0.29; ♀ 0.97-1.08/0.30-0.34), hand with pedicel 1.8-2.0 (♀ 1.6-1.8) times (0.90-0.95/0.48-0.49; ♀ 0.91-1.03/0.53-0.65), chela with pedicel 4.1-4.7 (♀ 3.5-3.9) times (length 1.97-2.28; ♀ 2.07-2.31), length of finger 1.12-1.41 (♀ 1.24-1.36).

DESCRIPTION OF TRITONYMPH (1 specimen, Santa Cruz). Pedipalps: femur not measured, patella 3.4 times (0.97 mm/0.28 mm), hand with pedicel 2.0 times (0.95/0.47), chela with pedicel 4.7 times (length 2.21 mm), finger 1.4 times longer than hand with pedicel, length 1.53 mm. Movable chelal finger: 10 stout microsetae near *b*, 19 lanceolate setae near *t*. Half-tergites I/II with 2 setae, III 3, IV-X 4.

TRITONYMPH (1 specimen, Santa Fé): Pedipalps: femur 4.3 times (1.08 mm/0.25 mm), patella 3.9 times (0.90/0.25), hand with pedicel 1.8 times (0.87/0.47), chela with pedicel 4.2 times (1.97 mm), without pedicel 4.0 times (1.87 mm) longer than broad, finger 1.4 times longer than hand with pedicel, length 1.18 mm. Movable chelal finger: 6 stout microsetae near *b*, 16 lanceolate setae near *t*.

TRITONYMPH (1 specimen, Fernandina): Pedipalps: femur 4.0 times (0.84/0.21), patella 3.3 times (0.74/0.23), hand with pedicel 1.9 times (0.72/0.38), chela with pedicel 4.1 times (length 1.54 mm), without pedicel 3.9 times (1.47 mm) longer than broad, finger 1.2 times longer than hand with pedicel, length 0.89 mm; telotarsi basally swollen (as in tritonymphs from other islands).

TRITONYMPH (1 specimen, San Cristobal): Pedipalps: femur 4.3 times (1.21 mm/0.28 mm), patella 3.3 times (1.04/0.32), hand with pedicel 1.8 times (0.98/0.54), chela with pedicel 4.3 times (length 2.34 mm) longer than broad, finger 1.46 times longer than hand with pedicel, length 1.44 mm.

DESCRIPTION OF DEUTONYMPHS (2 specimens, Pinta; 1 specimen, San Cristobal): Pedipalps: femur 3.9-4.1 times (0.76-0.92/0.20-0.22), patella 3.1-3.4 times (0.70-0.76/0.21-0.25), hand with pedicel 1.9-2.0 times (0.68-0.77/0.34-0.40), chela with pedicel 4.2-4.4 times longer than broad (length 1.52-1.69 mm), finger 1.3 times longer than hand with pedicel, length 0.91-1.02 mm; teeth of chelal fingers: 65/52; 20 lanceolate setae near *t* on movable finger, 7 stout microsetae near *b*; chelicera with 5 setae; telotarsi basally swollen. Half-tergite I with 1 seta, II-III 2, following with 3 setae;

DESCRIPTION OF PROTONYMPH (1 specimen, Pinta): Pedipalps: femur 4.0 times (0.58/0.15), patella 3.1 times (0.49/0.17), hand with pedicel 1.9 times (0.49/0.26), chela with pedicel 4.4 times (length 1.13 mm), finger 1.3 times longer than hand with pedicel, length 0.65 mm. All half-tergites with 1 seta only, teeth of chelal fingers 54/39; chelicera with 4 setae (*sb* absent), galea with 3 apical/subapical branchlets, subgaleal seta absent.

REMARKS: *Garypus granosus* sp. n. belongs to the group with a tarsal articulation of leg IV transverse, or nearly so, as defined by Lee (1979), and is distinguishable from *G. gracilis* Lee, 1979 by its granular (not reticulate) pedipalps, smaller size and somewhat more slender pedipalpal chela; from *G. sini* Chamberlin, 1923 by its more slender pedipalps (e.g. femur 3.3 times vs. 4.5-5.6 times longer than broad), from *G. giganteus* Chamberlin, 1921 (all three from western coast of Mexico) by its lesser size and tergal sculpturing. *Garypus bonairensis* Beier, 1936 (and subspecies) (Wagenaar-Hummelink, 1948) from the Caribbean islands is distinguished by its contrasted coloration and slightly bigger size, and by a more pronounced sexual dimorphism in size. *Garypus floridensis* Banks, 1895 (from Florida) (Hoff, 1946) has similar pedipalpal proportions and measurements, but differs from *G. granosus* sp. n. by shorter chelal fingers (only as long as hand with pedicel, and carapace distinctly shorter than femur), as opposed to being distinctly longer than the hand with pedicel and carapace as long as the femur in *G. granosus* sp. n.). *Garypus viridans* Banks, 1909 from Colombia (Santa Marta) is only known from a single tritonymph (Muchmore, 1991) which differs from that of *G. granosus* sp. n. in being larger (e.g. pedipalpal femur 1.34 mm vs. 0.84-1.21 mm) and having more slender pedipalps (e.g. femur 5.05 vs. 4.0-4.3 times longer than broad).

This species and its populations on different islands would be a highly interesting subject for genetic population studies to clarify dispersal routes and the taxonomic status of its populations.

CHEIRIDIIDAE

Cryptocheiridium confundens sp. n.

Figs 55-59

HOLOTYPE: RBINS; ♂; **Pinzon**: Western side forest, 20.I.1974, leg. S. Jacquemart (33).

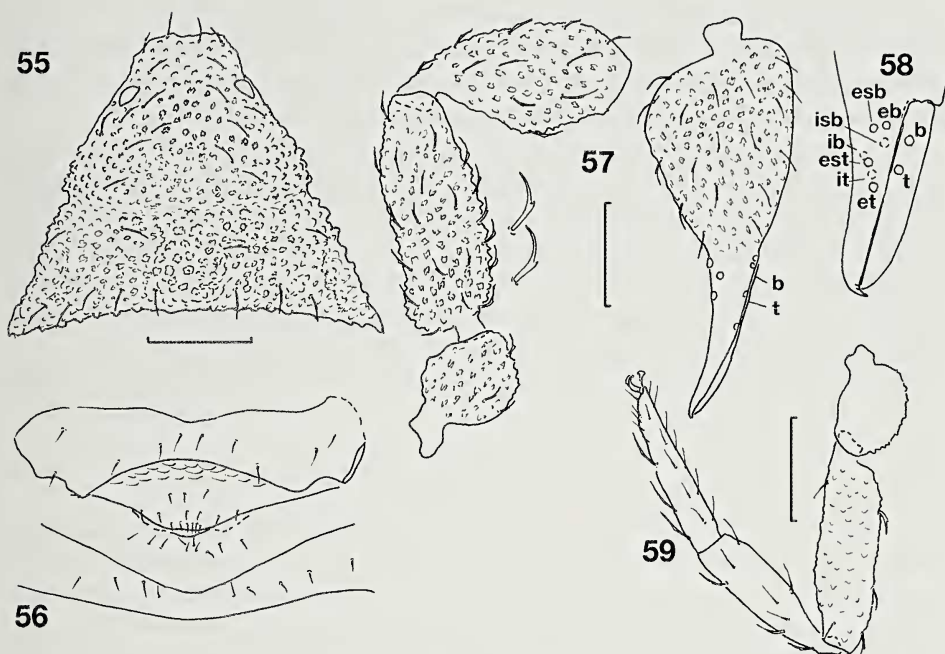
PARATYPES: **Champion**, NE Floreana: MHNG; 1♂; arid zone, litter sifting, cactus, 22.IV.1992, leg. S. Peck (92-136). – **Espanola**: MHNG; 4♂ 5♀ 5T; Punta Suarez, 10 m, litter under bushes in seabird rookery, 10.VI.1985, leg. S. & J. Peck (85-187). – MHNG; 1♂ 2♀; Punta Suarez, 30 m, shrub litter, 29.IV.1992, leg. S. Peck (92-144). – **Fernandina**: MHNG; 3♂ 1♀ 1D; 5 km NE Cabo Hammond, 120 m, crater bottom litter, Cerro Verde, 10.V.1991, leg. S. Peck (91-127). – **Isabela**: MHNG; 1♂; Punta Garcia, north of Volcan Alcedo, dry zone, 20 m, under *Scalesia affinis*; decayed leaf litter and soil, 21.II.1987, leg. H. Schatz (87-G065). – **Pinzon**: RBINS; 1♂; western side forest, 20.I.1974, leg. S. Jacquemart (33). – RBINS (1T 1D)/MHNG (1♂ 1♀); eastern slope with *Croton* and *Prosopis*, 20.I.1974, leg. S. Jacquemart (34). – **Santa Cruz**: RBINS; 1T; CDRS, bord de la mer, 10.I.1974, leg. S. Jacquemart (7). – CDRS; 1♀; *Scalesia* zone, soil sample, Berlese, 21.V.1986, leg. S. Abedrabbo. – MHNG; 7♂ 14♀ 9T 2D; south-eastern part, Punta Roca fuerte, arid coast, *Cordia* litter, 7.V.1992, leg. S. Peck (92-161). – **South Plazas**: MHNG; 3♂; arid shrubs and succulents, in litter, 6.V.1992, leg. S. Peck (92-162).

OTHER SPECIMENS: **Isabela**: 1P; Punta Garcia, north Volcan Alcedo, dry zone, 20 m, decayed leaf litter and soil, under *Scalesia affinis*, 21.II.1987, leg. H. Schatz (87-701). – **Pinzon**: RBINS; 3D; top of island, 20.I.1974, leg. S. Jacquemart (32B). – **Santiago**: 1♀ 2T 1D; southern side, opposite of Sombrero Chino, dry zone, 5 m, under dead *Cryptocarpus pyriformis* tree, woody litter, 21.II.1987, leg. H. Schatz (87-691). – **Sombrero Chino**: 1T 1D; northern part, littoral zone, 5 m, under *Sesuvium edmonstonei*, decayed leaf litter with pieces of wood and sand, 21.II.1987, leg. H. Schatz (87-688).

ETYMOLOGY: The name is the present participle of the Latin verb *confundere*, meaning “to confound, to confuse”.

DIAGNOSIS: The new species is characterized by trichobothria *b* and *t* being distinctly separated (by at least 2 areolar diameters), by the relatively slender pedipalps (femur 3.0-3.3 times, patella 2.1-2.4 times, hand with pedicel 1.4-1.5 times, chela with pedicel 2.7-2.8 times longer than broad) and by its size (lengths of femur ♂ 0.22-0.24, ♀ 0.25-0.27 mm, patella ♂ 0.21-0.22, ♀ 0.22-0.24 mm, chela ♂ 0.35-0.38, ♀ 0.37-0.39 mm); ten tergites visible dorsally.

DESCRIPTION OF ADULTS: Strongly sclerotized species. Setae on carapace, pedipalps and tergites curved, with a small tooth on convex side and enveloped by a thin transparent cover (Fig. 57). Carapace (Fig. 55) broader than long, two globular eyes present, coarse granula connected by ridges, a distinct, laterally procurved transverse furrow present, no lateral humps in prozone (but some acute lateral granula), metazone without, or with very indistinct, lateral depressions, round median depression of metazone not in contact with transverse furrow, but touching posterior margin, posterior margin with protruding granula; 4 setae on anterior, 8-10 setae on posterior margin. Ten tergites visible from above, all distinctly divided, sculptured like carapace, with protruding granula on posterior margins; half-tergites I-III 4-7 setae, IV-X 7-8 marginal setae + 1 lateral seta, segment XI with 2-4 dorsal setae. Manducatory process with 2 marginal (1 suboral seta) and 1 discal setae, pedipalpal coxa itself granular, 6-8 setae, coxa I 4, II 4 (7), III 4-6, IV undivided, but with a flat median incurvation, 5-6 setae on each coxa. Anterior genital operculum of ♂ (Fig. 56) with 15-18 setae (6 tiny marginal and 9-12 normal discal setae), that of ♀ with 2 sclerotized plates, each bearing 4 setae; male genital organ apparently without distinctive charac-



FIGS 55-59

Cryptocheiridium confundens sp. n., ♂ holotype. (55) Carapace. (56) Genital region. (57) Left pedipalp, setae omitted on chelal fingers. (58) Trichobothrial pattern. (59) Leg IV. Scale units 0.1 mm.

ters, lateral sacs long, distal two-thirds enlarged and wrinkled; female with a pair of small cribrate plates. Sternites V-X divided, sternite III 8-13 setae (2-5 medial short discal setae), without suprastigmal setae, IV 10-12 + 0/1 suprastigmal setae, half-sternites V-X with 5-6 marginal setae and one lateral seta each on VII-X, VI/VII with dark median sclerotization, segment XI with ventral 2 setae.

Chelicera: hand with 4 smooth setae, fixed finger with 3 retrorse teeth and 2 granular ones, movable finger with a small, triangular, distal lobe, galea short and acute in male, with 3 apical branchlets in female, serrula exterior with 10-11 lamellae, rallum of 4 setae, distal one sail-like, 2nd and 4th of equal length and shorter than 3rd.

Pedipalps (Figs 57-58) covered by coarse, acute granula; trochanter 1.4-1.7 times longer than broad, femur abruptly enlarged and shouldered, lateral face concave in basal third, 3.0-3.3 times, patella 2.1-2.4 times, club 1.9 times, hand with pedicel 1.4-1.5 times longer than broad and 1.1-1.3 times longer than finger, chela with pedicel 2.7-2.8 times, without pedicel 2.5-2.7 times longer than broad; fixed finger with 14-17 teeth (distal ones acute, basal ones lower) almost reaching to *est*, movable finger with 12-16 retrorse low, broad teeth, almost reaching to *t*; venom ducts not observed; trichobothria (Fig. 58): 7 on fixed finger (4 anti-axial, 3 para-axial), all trichobothria placed in basal half of fixed finger, without separation of a distal from a basal group; on movable finger *t* distinctly distal to *b* (separated by about 2 areolar diameters) and at same horizontal level.

Leg I (δ ♀): femur+patella without suture, 2.9-3.5 times, tibia 2.7-3.3 times, tarsus 4.1-4.8 times longer than deep; leg IV (Fig. 59): femur+patella 3.6-3.9 (δ) (δ 3.9-4.3) times, tibia 3.6-4.2 (δ) (δ 3.7-4.9) times, tarsus 5.4-5.6 (δ) (δ 5.4-5.7) times longer than deep; arolia undivided, as long as smooth claws.

MEASUREMENTS of 5 δ (holotype, paratypes from Champion, Duncan, Santa Cruz, South Plazas) (2 ♀, Espanola, Santa Cruz): Total length 0.88-0.98. Carapace 0.24-0.27/0.34-0.35 (♀ 0.28/0.38-0.40). Pedipalps: trochanter 0.12-0.13/0.08-0.09 (♀ 0.13-0.15/0.08-0.09), femur 0.22-0.24/0.08 (♀ 0.25-0.27/0.08), patella 0.21-0.22/0.09 (0.22-0.24/0.10-0.11), hand with pedicel 0.19-0.21/0.13-0.14 (♀ 0.20-0.21/0.14-0.15), length of pedicel 0.02 (♀ 0.03), length of finger 0.16-0.18 (♀ 0.17-0.19), length of chela with pedicel 0.35-0.38 (♀ 0.37-0.39), without pedicel 0.33-0.36 (♀ 0.34-0.37). Leg I: femur+patella 0.15-0.16/0.04-0.05 (♀ 0.16-0.18/0.05-0.06), tibia 0.11-0.12/0.04 (♀ 0.12-0.13/0.04), tarsus 0.11-0.12/0.03 (♀ 0.11-0.14/0.03); leg IV: femur+patella 0.20-0.21/0.05-0.06 (♀ 0.22-0.25/0.06), tibia 0.15-0.17/0.04 (♀ 0.16-0.17/0.04), tarsus 0.14-0.16/0.03 (♀ 0.22-0.25/0.03).

DESCRIPTION OF TRITONYMPH (1 specimen, Santa Cruz): Generally similar to female. Total length 0.81 mm; carapace 0.7 times longer than broad, 4 setae on anterior, 6 on posterior margin; half-tergites I/II 4 setae, III 6, IV-X 6-7 + a small lateral seta, XI 4; manducatory process 3 setae, pedipalpal coxa 4, coxa I-III 4, IV 4-5; sternite II with 2 median marginal setae, half-sternites III 3+0, IV 2+1, V-VII 4, VIII-X 4-5+1 lateral seta, sternite XI 2. Chelicera as in ♀, except serrula exterior with 9 lamellae. Pedipalps: femur 2.8 times longer than broad (0.21/0.08 mm), patella 2.2 times (0.19/0.08), hand with pedicel 1.6 times (0.19/0.09) longer than broad and 1.2 times longer than finger, finger length 0.16 mm, length of chela with pedicel 2.9 times (0.35 mm), without pedicel 2.8 times longer than broad (0.33 mm); both fingers with 13 teeth each; trichobothria: 7 (4 anti-, 3 paraxial ones)+2. Leg IV: femur+patella 3.7 times (0.18/0.05 mm), tibia 3.3 times (0.13/0.04), tarsus 3.9 times (0.13/0.03) longer than deep.

REMARKS: The presence of 9 trichobothria (7+2) on the chelal fingers and of 4 setae in the rallum, along with the shape of the carapace (lateral humps absent or indistinct in anterior half), the presence of protruding granula on posterior margin of carapace and anterior tergites, and the stout pedipalps place this species in the genus *Cryptocheiridium*. Presently 11 species are recognized in the genus *Cryptocheiridium*, most of them distributed in Africa and eastern Asia. Only two species are recorded from the Neotropical realm: *C. elegans* Dumitresco & Orghidan, 1981 (from Cuba, placed in the subgenus *Cubanocheiridium*) and *C. antiquum* Schawaller, 1981 from Dominican amber. The new species is distinguished from *C. elegans*, as well as from most African species, by the positions of trichobothria *t* and *b*, which are in the basal third of the movable finger and clearly separated (by about 2 areolar diameters), whereas they are near the finger base and close together in *confundens* sp. n. *Cryptocheiridium antiquum* shares with *C. confundens* sp. n. a similar trichobothrial pattern of the movable finger, but apparently possesses only 6 trichobothria on the fixed finger (2 paraxial ones only); furthermore it seems to be smaller (e.g. femur length 0.16-0.20 mm) and has slightly stouter pedipalps (e.g. patella 1.8-2.1 times vs. 2.1-2.4 times

longer than broad). *Cheiridium insulare* Vitali-di Castri, 1984 from Guadeloupe might belong to the genus *Cryptocheiridium*. This opinion has been confirmed by Dr Mark Judson who had examined the holotype mounted on two slides and annotated "*Cryptocheiridium* (MJ det. 2000)" (Dr M. Judson, in litt. 2013) and is here proposed as *Cryptocheiridium insulare* (Vitali-di Castri, 1984) **comb. n.** It shares with *C. confundens* sp. n. similar pedipalpal proportions and measurements, but differs in having apparently a more robust palpal femur (2.8 times vs. at least 3.0 times longer than broad), perhaps more vaulted eyes (Dr M. Judson, in litt. 2013) and a slightly different trichobothrial pattern: *b* (= *sb* in Vitali-di Castri, 1984: fig. 40) on movable finger in more distal position, distal to *isb* and on level with *ib* vs. *b* being proximal to *ib*.

The limits of the genera *Cheiridium* and *Cryptocheiridium* are still inadequately defined (Mahnert, 2001), as is the position of the subgenus *Cubanocheiridium* relative to *Cryptocheiridium* s.str.

Neocheiridium galapagoense Beier, 1978

Neocheiridium galapagoense Beier, 1978: 540-541, fig. 5 (type locality: Insel Pinzon, Süd-Abfall des höchsten Gipfels).

Neocheiridium corticum (not Balzan, 1890): Beier, 1977: 103 - misidentification (specimens examined, NHMW).

SPECIMENS STUDIED: **Bartolome:** 1 ♀ 1T; littoral, mangrove litter sifting, 28.III.1992, leg. S. Peck (92-63). – **Fernandina:** 20 ♂ 8 ♀ 4T; 5 km NE Cabo Hammond, 120 m, crater bottom litter, Cerro Verde, 10.V.1991, leg. S. Peck (91-127). – **Floreana:** 2 ♂ 1 ♀ 1T; 1 km S Black Beach, crevice, litter supralittoral, leg. S. Peck (89-157). – 1 ♀; Punta Cormoran, littoral zone, sand beach, shrub, soil wash, 21.IV.1992, leg. J. Cook & S. Peck (92-134). – 1 ♂; peninsula south of Black Beach, littoral zone, 5 m, under *Cryptocarpus pyriformis*, leaf litter in crevice, 21.I.1987, leg. H. Schatz (87-550). – **Gardner** at Floreana: 6 ♂ 6 ♀; arid zone, litter, 2.V.1992, leg. S. Peck & J. Cook (92-148). – **Genovesa:** 1T 1D; interior of island, 30 m, dry zone, in lava crevice, under *Bursera graveolens*, decayed leaf litter, 14.II.1985, leg. H. & I. Schatz (85-146). – **Isabela:** 50863; 1 ♂ 3 ♀; 1 km S of Cerro Verde, 320 m, from balls of epiphytic moss growing about 4-5 m above ground on large introduced trees, 16.I.1978, leg. W. G. Reeder. – 1 ♂ 1 ♀; 0.5 km S Santo Tomas, mixed forest litter, 350 m, soil under ferns, 7.VII.1985, leg. S. & J. Peck (85-209). – 2 ♀; Villamil, Jaboncilla Forest, 150 m, litter, 6.III.1989, leg. S. Peck (89-107). – 1 ♂; 10 km NE Tagus Cove, 1250 m, V. Darwin, humid *Scalesia* litter, 20.V.1992, leg. S. Peck (92-193). – 1 ♂; Sierra Negra, in "Trocha", burnt area, transition/*Scalesia* zone, 230 m, under dead *Sapindus saponaria*, moss from tree, 7.II.1987, leg. H. Schatz (87-614). – 1T; Sierra Negra, in "Trocha", transition/*Scalesia* zone, 230 m, under *Sapindus saponaria*, moss from roots and soil, 7.II.1987, leg. H. Schatz (87-617). – 1 ♂ 2T; Sierra Negra, in "Trocha", transition/*Scalesia* zone, 230 m, under *Sapindus saponaria*, dead moss and rotten pieces of wood, from barks, 7.III.1987, leg. H. Schatz (87-618). – 1T; Sierra Negra, W Villamil near Quinta Playa, dry zone, 20 m, under *Pisonia floribunda*, well decayed leaf litter, 8.II.1987, leg. H. Schatz (87-626). – 1 ♂; Sierra Negra, W Villamil near Quinta Playa, dry zone, 30 m, under *Pisonia floribunda*, decayed leaf litter and pieces of wood, 8.II.1987, leg. H. Schatz (87-628). – 1 ♀; Sierra Negra, southern crater rim, 1000 m, pampa, leaf litter under *Darwiniothamnus lancifolius*, 10.III.1987, leg. H. Schatz (87-635). – 1D; Sierra Negra, below crater rim near Cerro de los Chanchos, pasture zone-pampa, 920 m, leaf litter under *Tournefortia rufo-sericea*, 10.II.1987, leg. H. Schatz (87-639). – **Marchena:** RBINS; 1 ♀; 21.II.1974, leg. S. Jacquemart (93a). – **Pinta:** RBINS; 2 ♂ 2 ♀ 3T; zone aride, 27.II.1974, leg. S. Jacquemart (109, 110). – **Pinzon:** RBINS; 1 ♂ 5 ♀ 3T 4D; beach with *Sesuvium*, 20.I.1974, leg. S. Jacquemart (31; 24965). – RBINS; 1 ♂ 1 ♀ 2T; bord du cratère, 22.VI.1975, leg. H. Franz (SA 331: type locality). – 22 ♂ 20 ♀ 4T 2D; SE slope, 380 m, pampa, litter sifting, 27.VI.1991, leg. S. Peck (91-255). – 1 ♂; eastern part, Lower Dry zone, 100 m, under *Cordia lutea* and *Croton scouleri*, decayed leaf litter, 31.I.1987, leg. H. Schatz (87-G056). – 2 ♂ 1 ♀ 1T; summit of the island, Fern Sedge zone, 460 m,

under ferns, litter and humus, 2.II.1987, leg. H. Schatz (87-G057). – 1T; summit of island, Fern Sedge zone, 460 m, partially decayed fern litter, 2.II.1987, leg. H. Schatz (87-596). – 4♂ 2♀ 1D; summit of island, Fern Sedge zone, 460 m, grass litter, 2.II.1987, leg. H. Schatz (87-597). – 1♀; summit of the island, Fern Sedge zone, 460 m, grass litter and humus, under *Zanthoxylum fagara* and *Chiococca alba*, 2.II.1987, leg. H. Schatz (87-599). – 1♀; passage to southern slope, beside big rock, Fern Sedge zone, 340 m, *Croton scouleri*, *Alternanthera echinocephala*, under *Cordia leucophlyctis*; decayed leaf litter and black soil, 3.II.1987, leg. H. Schatz (87-603). – **San Cristobal**: 1♂ 1♀; 1 km W Progreso, 300 m, litter under coffee, 18.II.1989, leg. S. Peck (89-72). – **Santa Cruz**: CDRS; 4♂ 2T 1D; *Scalesia* zone, soil sample, Berlese, 21.V.1986, leg. S. Abedrabbo. – 18♂ 14♀ 12T 2D; Academy Bay, CDRS, litter at bottom of (Darwin) Grieta Iguana, 29.V.1985, leg. S. & J. Peck (85-178). – 3♂ 2♀ 1T 1P; 4 km SW Puerto Ayora, alt. 1 m, litter on bottom of Grieta, 1.II.1989, leg. S. Peck (89-24). – 1♂; south-east of island, Punta Roca fuerte, arid coast, *Cordia* litter, 7.V.1992, leg. S. Peck (92-161). – **Santa Fé**: 39273; 1♀; rock outcrops of second barranco 1 km SSW of Camp Bay, 100 m, litter of *Cordia* and *Croton*, sheltered but very dry, 24.I.1979, leg. W. G. Reeder. – **Santiago**: 2T; southern side, opposite of Sombrero Chino, Dry zone, 5 m, under dead *Cryptocarpus pyriformis* tree, woody litter, 21.II.1987, leg. H. Schatz (87-691). – **Seymour**: RBINS/MHNG (1♂ 1♀); 3 ex.; SW end, litter under littoral shrubs, 1 m, 23.I.1989, leg. S. Peck (89-20). – **South Plazas**: 2♂ 1♀ 1T; arid shrubs and succulent litter, 6.V.1992, leg. S. Peck (92-162). – 1T; northern part, littoral dry zone, 10 m, under *Grabowskia boerhaaviaefolia*, litter, 20.II.1987, leg. H. Schatz (87-676).

SHORT DESCRIPTION (measurements and proportions based on 5♂ 4♀ from Barrington, Duncan, Fernandina, Pinta, Pinzon, Santa Cruz, Seymour), the new specimens correspond well with Beier's description (1978). Carapace with 2 globular eyes, 0.7-0.8 times longer than broad, anterior lateral humps indistinct, coarsely granular, one deep median transverse furrow, median depression of metazone touching transverse furrow and opening into posterior margin; setae of carapace and tergites with exsudate, some strongly broadened; posterior margin of carapace and anterior tergites without protruding granula. Tergites mostly with 8-10 setae (some with 6 or up to 14!) (Beier, 1978 indicated the seta number erroneously for half-tergites "Halbtergite"). Manducatory process with 3 setae, suboral one tiny, pedipalpal coxa itself 6-7 setae, coxa I 3, II 4, III 4-5, IV undivided, 6-7 setae on each side; anterior genital operculum with 11-12 setae (4-6 discal ones), chaetotaxy of half-sternites: III 5-6, IV 4-6, suprastigmal setae lacking, V-X mostly 5-7, XI 2-4 (total). Chelicera with 4 smooth setae on hand, fixed finger with 3 retrorse teeth, galea short, cone-like (♂), subgaleal seta reaching tip of galea, galea of ♀ with 3 apical branchlets, subgaleal seta not reaching galea tip; serrula exterior with 10 lamellae; rallum with 4 blades, distal one broad, 3rd longer than 2nd and 4th which are of same length. Pedipalps: trochanter 1.4-1.5 (♂) (♀ 1.5-1.6) times longer than broad, femur 2.9-3.1 (♂) (♀ 2.4-3.2) times, patella 2.2-2.4 (♂) (♀ 2.3) times, its club 1.7-1.9 (♂) (♀ 1.8) times, hand with pedicel 1.5-1.7 (♂) (♀ 1.4-1.6) times longer than broad and 1.2-1.5 (♂) (♀ 1.1-1.4) times longer than finger, chela with pedicel 2.5-2.8 (♂) (♀ 2.6-2.8) times, without pedicel 2.4-2.7 (♂) (♀ 2.4-2.6) times longer than broad; fixed finger with 15-19 teeth reaching *et* (distal ones triangular, basal ones low and broad), movable finger with 16-18 teeth, basal ones indistinct; venom ducts short; trichobothrial pattern: mostly with 7 trichobothria (4 antiaxial, 3 paraxial ones) on fixed finger, one (*t*) on movable finger; *esb* on fixed finger frequently absent, reducing the formula from 7+1 to 6+1. Out of 114 specimens 65 (31♂ 26♀ 8T) possess 7+1, 48 (25♂ 20♀ 3T) only 6+1 on both sides, 1♂ with 7+1 on left, 6+1 on right chela. Leg I: femur+patella 3.1 times, tibia 2.6-2.8 times,

tarsus 3.5-3.9 times longer than deep; leg IV: femur+patella without suture, 3.9-4.2 times, tibia 3.4-4.2 times, tarsus 4.4-5.8 times longer than deep; arolia simple, more or less as long as smooth claws.

MEASUREMENTS (♂ ♀): Total length 0.90-0.95. Carapace 0.27-0.31/0.34-0.41. Pedipalps: trochanter 0.13-0.14/0.09-0.11, femur 0.21-0.26/0.08-0.09, patella 0.21-0.24/0.09-0.10, hand with pedicel 0.19-0.22/0.13-0.14, length of pedicel 0.02-0.03, length of finger 0.15-0.17, length of chela with pedicel 0.36-0.37. Leg I: femur+patella 0.16-0.18/0.05-0.06, tibia 0.12/0.04-0.05, tarsus 0.12-0.13/0.03. Leg IV: femur+patella 0.21-0.25/0.05-0.06, tibia 0.16-0.18/0.04-0.05, tarsus 0.16-0.18/0.03-0.04.

REMARKS: *Neocheiridium galapagoense* is easily distinguishable from *N. corticum* (Balzan, 1890) by the shape and size of the metazonal depression: oval and touching transverse furrow and posterior margin of carapace in *N. galapagoense*, round and not in contact with either the transverse furrow or the posterior margin of carapace in *N. corticum*. Furthermore, it possesses slightly more slender legs IV (femur+patella at least 3.9 times in *N. galapagoense* vs. at most 3.5 times longer than deep in *N. corticum*). The presence of either 3 or 4 antiaxial basal trichobothria on the fixed finger seems independent of sex and can be observed within the same population. However, in one population (from Fernandina, Cerro Verde) all examined specimens (32 ♂ ♀ T) had only 3 antiaxial trichobothria, *esb* being constantly absent.

The type specimens of *Neocheiridium galapagoense* have been checked. The ♂ holotype (NHMW 22125) and 7 ♂ 1 ♀ 2 T paratypes (NHMW 22127) possess 7 trichobothria on the fixed chelal finger (4 anti- and 3 paraxial ones), whereas the allotype ♀ (NHMW 22126) has 6 (3+3) trichobothria.

Taxonomic problems of the genus have been pointed out and discussed by Mahnert (1982) and Mahnert & Aguiar (1986), without presenting a solution for the species possessing only 5 basal trichobothria on the fixed finger.

ATEMNIDAE

Paratemnoides nidificator (Balzan, 1888)

Figs 60-63

Chelifer nidificator Balzan, 1888, unpaginated, figs 1-3 (type locality: Asuncion, Paraguay).

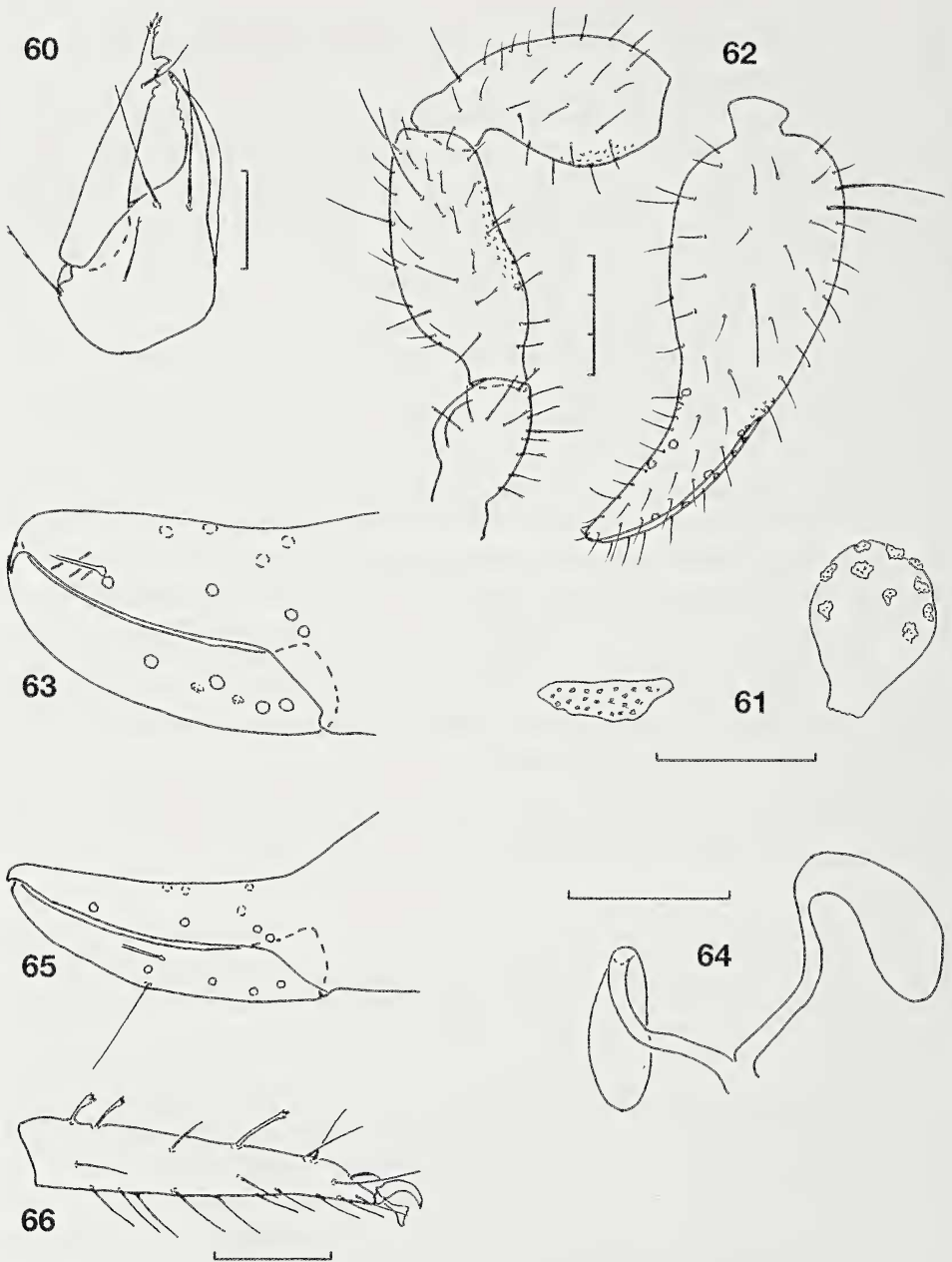
Atemnus insularis Banks, 1902: 68-69, plate 2, fig. 11 (type locality: Albemarle=Isabela) **syn. n.**

Paratemnus insularis (Banks): Chamberlin, 1934: 8; Beier, 1940: 171.

Paratemnoides insularis (Banks): Harvey, 1991: 471.

SPECIMENS STUDIED: **Isabela**: RBINS; 1 ♂ 3 ♀ 3 T; Volcan Wolf, Palo Santo wood (= *Bursera graveolens*), lowland, dry arid zone, 0-5 m, 23.III.1988, leg. L. Baert, J.-P. Maelfait & K. Desender (B.88/469). - 2 ♀; 13 km NW Villamil, Jaboncilla (= *Gouania polygama*) forest, 130 m, Malaise, 22.-30.IV.1996, leg. S. Peck (96-127). - **Santa Cruz**: 39346, 39362; 2 ♀; 10 m, under rotten damp *Opuntia*, 16.III.1975, leg. W. G. Reeder.

DESCRIPTION (1 ♂ 3 ♀ from Isabela and Santa Cruz): Carapace 0.94-1.04 times wider than long, darker in anterior half, 2 large, distinct eye spots, 4-6 setae at anterior, 8-9 setae at posterior margin; tergites I-V and X/XI mostly undivided, others divided, half-tergites usually with 5-6 (very rarely 3 or 4) marginal setae and 1 lateral anterior seta; XI (total) with 14-15 setae (2 submedial tactile setae, 2 medial discal setae); manducatory process with 3 marginal and 1 discal setae, pedipalpal coxa itself with 13-15 setae (1 tactile seta), coxa I 9-10, II 9-11, III 7-8, IV 14-19. Anterior genital operculum with about 15 discal and marginal setae; genital organ of ♂ similar to that of *P. nidifi-*



FIGS 60-66

Paratemnoides nidificator (Balzan, 1888), ♂ (unless indicated otherwise) (60-63). *Rhopalochernes insulanus* Beier, 1978, ♀ holotype (64-66). (60) Right chelicera. (61) Cribrate plates of ♀. (62) Left pedipalp. (63) Trichobothrial pattern. (64) Spermatheca. (65) Trichobothrial pattern. (66) Tarsus IV. Scale units 0.1 mm.

cator; cribrate plates as in Fig. 61; sternites divided, half-sternites with about 6-7 marginal and 1 lateral anterior setae; sternite XI (total) with 14 setae (4 tactile setae). Chelicera: 4 setae on hand, basal two finely dentate, galea long, with 6 apical/subapical branchlets, serrula exterior with 20-22 lamellae, rallum with 4 setae, the distal one dentate. Pedipalps (Figs 62-63): femur, patella and hand (latero-distally) finely granular, trochanter with two low humps, 1.8-1.9 times longer than broad, femur 2.1-2.3 times longer than broad, patella 1.9-2.1 times, hand with pedicel 1.9-2.4 times, chela with pedicel 2.9-3.5 times, without pedicel 2.7-3.3 times longer than broad, finger 1.6-1.7 times longer than hand with pedicel and 1.2-1.5 times longer than breadth of hand; fingers not gaping, fixed finger with 35-39 acute teeth, movable finger 45-53 teeth, venom duct short, nodus ramosus at level of trichobothrium *et*; a few tiny modified setae in front of *et*. Leg I: femur 1.2-1.3 times longer than deep, patella 2.2-2.3 times, tibia 2.8-3.0 times, tarsus 3.2-3.5 times longer than deep, patella 1.6-1.7 times longer than femur; leg IV: femur+patella 2.7-2.8 times, tibia 3.1-3.2 times, tarsus 2.7-3.4 times longer than deep, with a long tactile seta near base.

MEASUREMENTS: Total length 3.1-4.3. Carapace 0.84-0.93/0.81-1.00. Pedipalps of ♂ (♀): femur 0.66/0.29 (0.70-0.73/0.32-0.33) patella 0.65/0.32 (0.70-0.71/0.34-0.36), hand with pedicel 0.80/0.41 (0.88-0.89/0.37-0.44), length of pedicel 0.08 (0.08-0.10), of finger 0.48 (0.54), of chela with pedicel 1.18 (1.29-1.34). Leg I of ♂ (♀): femur 0.23/0.18 (0.23-0.25/0.20), patella 0.36/0.16 (0.40-0.42/0.18-0.19), tibia 0.33/0.12 (0.36-0.38/0.13), tarsus 0.30/0.09 (0.30-0.32/0.09); leg IV: femur+patella 0.79/0.28 (0.86-0.87/0.31-0.32), tibia 0.53/0.17 (0.58-0.59/0.18-0.19), tarsus 0.36/0.13 (0.39-0.40/0.12-0.13).

REMARKS: *Paratemnoides insularis* has never been recorded since its original description. I could not find differences between the specimens examined here and the lecto- and paralectotypes of *P. nidificator* and other specimens attributed to *nidificator* from Paraguay, Brazil or French Guyana (Mahnert, 2013). Proportions and morphology of pedipalps are more or less identical, and the spermatheca and male genital organ do not seem to present differences. Although I did not re-examine the type specimens, I consider *Atemnus insularis* to be a junior subjective synonym of *Paratemnoides nidificator*.

Paratemnoides nidificator is a widespread species in southern America. Its distribution on the Galapagos islands is probably limited by the availability of "suitable" tree species. This pseudoscorpion species (as others of this genus) occurs frequently under bark of dead or living trees and it is apparently gregarious.

CHERNETIDAE

Rhopalochernes insulanus Beier, 1978

Figs 64-66

Rhopalochernes insulanus Beier, 1978: 545-547, fig. 9 (type locality: Isabela, Volcan Sierra Negra, 900 bis 1000 m).

SPECIMENS STUDIED: NMHW 24727 ♂ holotype, 24728 ♀ paratype; **Isabela**: Volcan Sierra Negra, 900 bis 1000 m, Gesiebe aus Moos und Farnen, sehr feucht, 30.V.1975, leg. H. Franz (SA 302).

SHORT DESCRIPTION: The following indications complete the original description. Chelicera with 6 setae, the three basal ones with finely dentate apex; rallum

with 3 setae, the distal one apically dentate; serrula exterior with 16 lamellae; galea with apical fork and 4 lateral branches in distal half. Spermathecae (Fig. 64) paired, the apical parts oval and enlarged. Trichobothrial pattern as in Fig. 65. Leg IV (Fig. 66): distal seta on tarsus IV clavate, with dentate apex, and as long as depth of tarsus.

REMARKS: This species is only known from females, which were collected together with paratypes of *Parachernes franzi*. It was not present in the numerous samples studied here, hence no further taxonomic or distributional data are available.

***Parachernes (Parachernes) nigrimanus* (Banks, 1902)**

Figs 67-71

Chelanops nigrimanus Banks, 1902: 80 (type locality: Albemarle=Isabela)

Parachernes (Argentochernes) nigrimanus (Banks): Chamberlin, 1934: 12.

Parachernes nigrimanus (Banks): Beier, 1940: 171, Muchmore, 1999: 108-109.

Parachernes (Parachernes) nigrimanus (Banks): Harvey, 2013, unpaginated.

Parachernes d. darwiniensis Beier, 1978: 541-543, fig. 6 (type locality: Isabela); **syn. n.**

SPECIMENS EXAMINED: CAS 175 000; ♀ holotype; Albemarle Island, Iguana Cove, 1899 (JC-799.01001). – **Espanola**: RBINS; 1 ♂; second caleta W of Bahia Gardner, night catches, 16.-17.IV.1991, leg. L. Baert, J.-P. Maelfait & K. Desender (B.91/673). – **Fernandina**: TNSC 39258; 1 ♀; 23.IV.1979, leg. D. Werner. – **Floreana**: 39339; 1 ♂; Black Beach, 5 m, sweeping in *Acacia*, *Cryptocarpus*, *Plumbago* above beach, 17.II.1977, leg. W. G. Reeder. – RBINS; 1 ♂; Black Beach, night catches, 8.-9.IV.1991, leg L. Baert, J.-P. Maelfait & K. Desender (B.91/624). – RBINS; 1 ♂; south of Black Beach, dry arid zone, 5 m, pitfall, 8.-20.IV.1991, leg. L. Baert, J.-P. Maelfait & K. Desender (B.91/705). – 1 ♀; Black Beach, arid zone, beating, 20.-28.III.1989, leg. S. Peck (89-163). – 1 ♂; Cerro Pajas, 325 m, forest interior, FIT, 27.III.-18.IV.1996, leg. S. Peck (96-57). – **Isabela**: TNSC 39247; 1 ♂; flat between Beagle Crater and Volcan Darwin, 50 m, old burn “witer” grass, some *Waltheria*, dead *Bursera* and *Cordia*, night collection, no date, leg. W. G. Reeder (?). – 39245; 1 ♀; eastern slope of Volcan Alcedo, 340 m, *Bursera* stand with *Macraea*, *Waltheria*, under bark and in rotten trunk of *Bursera*, 19.V.1980, leg. W. G. Reeder. – 39252; 1 ♀; Volcan Alcedo, eastern slope, 780 m, sweeping, *Scalesia* branch tips only, *Scalesia* savanna, 13.V.1980, leg. W. G. Reeder. – 39246; 1D; Volcan Alcedo, eastern slope, 790 m, sweeping maidenhair fern stand on precipitous stream cut, moist, overhung by *Pisonia*, *Tournefortia*, 14.V.1980, leg. W. G. Reeder. – 39261; 3 ♂ 1T; Volcan Alcedo, eastern slope, 790 m, screened from eight finch and two mockingbird nests in *Zanthoxylum*, 5-7 ft above ground, *Cassia*, *Ipomoea*, *Tournefortia*, 14.V.1980, leg. W. G. Reeder. – 39028; 1 ♂ 1T; Volcan Alcedo, Bursera Camp, 340 m, 18.V.1980, leg. W. G. Reeder. – 39264; 1 ♀; eastern slope of Volcan Alcedo, 340 m, on or under exfoliating bark of *Bursera*, *Waltheria*, *Macraea*, 19.V.1980, leg. W. G. Reeder. – 39340; 1 ♂; Sierra Negra, road to Sierra Solitaria, 200 m, screened from epiphytic moss on *Psidium galapageium* and *Zanthoxylum*, *Scalesia-Guayavilla* assoc., 25.I.1975, leg. W. G. Reeder. – 39331; 1P; Sierra Negra, zona Velasco Ibarra, 780 m, screening of litter in encanada near *Scalesia* Quad, mostly fern, *Ipomoea*, *Zanthoxylum*, *Tournefortia*, 25.I.1978, leg. W. G. Reeder. – 39369; 1T; Cabo Berkeley, 40-140 m, under ash plates and lava erratics, orgo del burro, *Waltheria*, *Tribulus*, *Boerhavia*(?), 8.VIII.1977, leg. W. G. Reeder. – 39324; 1T; Cabo Berkeley, 20-90 m, sweeping in *Waltheria*, *Boerhavia* and *Alternanthea*, 8.VIII.1977, leg. W. G. Reeder; – RBINS; 1 ♀ 1T; Volcan Alcedo, flanc est, alt. 400 m, 2.IV.1986, leg. L. Baert, J.-P. Maelfait & K. Desender (144). – **Marchena**: 39366; 1 ♀; SW slope, Beach Camp area, 10 m, sweeping in *Waltheria* and *Lantana*, *Bursera-Croton* comm., 25.I.1977, leg. W. G. Reeder. – RBINS; 1 ♀; Punto Meijo, 0-5 m, 11.III.1988, leg. L. Baert, J.-P. Maelfait & K. Desender (411). – 1 ♀; Punta Espejo, arid zone, *Bursera* grassland, night collection, 11.III.1992, leg. S. Peck & J. Cook (92-17). – 1 ♂, SW Playa, arid zone, *Bursera* forest, Malaise trap, 30 m, 12.-24.III.1992, leg. S. Peck (92-28). – 1 ♀; SW Playa, arid zone, night collection, 23.III.1992, leg. S. Peck & J. Cook (92-69). – 1 ♀; Tagus Cove, arid zone, UV light and night collection, 20 m, 13.V.1992, leg. S. Peck & J. Cook (92-176). – **Rabida**: 39317; 1 ♀; north slope, 600-900 ft, from 8 old dismantled finch nests, from *Bursera*, *Opuntia*, and *Maytenus*, 29.IX.1979, leg. W. G. Reeder. – 39309; 1D; north slope, 600-900 ft, from 4 dis-

mantled nests (3 finch, 1 mockingbird) in *Maytenus-Croton*, 29.IX.1975, leg. W. G. Reeder. – 1T; NE Coast, arid zone, 40 m, FIT, 2.-11.VI.1991, leg. S. Peck (91-179). – 1P; beach, 0 m, under *Cryptocarpus pyriformis* near sea lion colony, leaf litter, 25.XII.1986, leg. H. Schatz (87-406). – **San Cristobal**: MHNG; 1 ♀; 2 km NE Baquerizo, littoral zone, 15.II.1989, leg. B. J. Sinclair (89-70). – 1D; 3 km E Wreck Bay, upper littoral, FIT, 2 m, 14.-19.III.1996, leg. S. Peck (96-12). – 1 ♂ 1 ♀; 2 km N Wreck Bay, arid zone, UV light, 17.III.1996, leg. S. Peck (96-33). – 1P; lake El Junco, Fern Sedge zone, 640 m, well decayed fern litter and soil, under *Pteridium aquilinum*, 1.I.1987, leg. H. Schatz (87-441). – 1P; around lake El Junco, *Miconia*/cultivated zone, 650 m; under *Psidium guajave* and *Pteridium aquilinum*, decayed leaf litter, 1.I.1987, leg. H. Schatz (87-G044). – 1P; in encada with small river, SE under lake El Junco, *Miconia* zone, 500 m, well decayed leaf litter and roots, under *Miconia robinsoniana* and *Pteridium aquilinum*, 1.I.1987, leg. H. Schatz (87-G045). – **Santa Cruz**: 1T 1P; Los Gemelos, 3 km N Santa Rosa, 570 m, *Scalesia* forest litter, 13.VI.1985, leg. S. & J. Peck (85-188a). – 2 ♂ 2 ♀; 10 km N Santa Rosa, 500 m, transect zone forest, FIT, 7.-30.III.1992, leg. S. Peck (92-5). – 1 ♂; 10 km N Santa Rosa, 500 m, trans. zone forest *Pisonia*, Malaise, 1.-30.IV.1992, leg. S. Peck (92-82). – 1 ♂ 2 ♀; 10 km N Santa Rosa, 500 m, trans. through *Pisonia* forest, FIT, 1-30.IV.1992, leg. S. Peck (92-83). – 1 ♂ 2T 1D; 10 km N Santa Rosa, 500 m, trans. zone forest, *Pisonia*, FIT, 1-30.V.1992, leg. S. Peck (92-220). – 1 ♂; 13 km N Santa Rosa, 300 m, arid zone, *Bursera* forest, FIT, 7-30.III.1992, leg. S. Peck (92-3). – 1 ♀, El Granillo, 300 m, 9 km N Los Gemelos, transect forest, UV light, 15.VI.1991, leg. S. Peck (91-229). – 1 ♀; CDRS, arid zone, beating, 19.I.1989, leg. S. Peck (89-21). – 1 ♀ 1D; CDRS, arid zone, Malaise-FIT, 40 m, 1-30.V.1991, leg. S. & J. Peck (91-110). – 1 ♀ 1P; Tortuga Bay, 1 m, litter on sand under machineel, 30.I.1989, leg. S. Peck (89-23). – 1 ♂; 5 km N Puerto Ayora, 110 m, low transition zone, Malaise-FIT, 1-30.V.1991, leg. S. & J. Peck (91-111). – 1 ♂; Puerto Ayora, village, UV light, 11.VI.1991, leg. S. Peck (91-219). – 1 ♀; CDRS, Punto Ayora, arid zone, at lights, 4-7.III.1992, leg. S. Peck et al. (92-1). – MHNG; 1 ♂; Puerto Ayora, synanthropic, 23.III.1997, leg. C. & B. Komposch. – 1T; north side, 1 km E Cal. Tortuga Negra, soilwashing, upperbeach, 2.IV.1989, leg. S. Peck (89-189). – MZBE; 1 ♂; Cueva Gilberto Moneayo, 16.VIII.1975, leg. O. Escola. – RBINS; 1 ♂; north slope, alt. 150 m, 2.IV.1988, leg. L. Baert, J.-P. Maelfait & K. Desender (503). – **Santa Fé**: 39277; 1 ♂; second barranco 1 km SSW of Camp Bay, fallen *Opuntia* trunk, very dry, *Croton-Cordia* association, 24.I.1979, leg. W. G. Reeder. – MHNG; 2 ♀; without locality; 17.XII.1988, leg. S. Abedrabbo. – **Santiago**: 39377; 1 ♂; 520 m, *Guayavilla* Quadrat, ca. 5 km SE Bahía Bucanera, sweeping in open *Guayavilla* parkland, heavy undergrowth of annual herbs, 20.IV.1975, leg. W. G. Reeder. – RBINS; 1 ♂; *Scalesia* Quadrat, 555 m, 29.III.2009, leg. L. Baert, F. Hendrickx & W. Dekoninck (B09/042). – MHNG; 1 ♀; Playa Espumilla, 5 m, open *Cordia* woodland, FIT, 4.-13.IV.1992, leg. S. Peck (92-101). – 1P; Sullivan Bay, behind beach, Dry Zone, 5 m, under *Pteridium aquilinum*, needle litter with pieces of wood and sand, 26.XII.1986, leg. H. Schatz (87-426). – **Seymour**: MHNG; 1 ♀; 10 m, arid zone, *Bursera* forest, UV light, 23.I.1989, leg. S. Peck (89-5).

DESCRIPTION (♂ ♀): Carapace brown, metazone with a dark, nearly quadrangular patch, whitish zone reaching lateral margin; tergites I/II with a median dark macula, lateral zones whitish, the following half-tergites brown, with a dark central spot within a lighter zone. Setae of carapace and tergites short, clavate, those of coxae and sternites mostly fine and acute. Carapace 1.1-1.3 times longer than broad; 2 eye spots present; 2 distinct, granular, transverse furrows present, the subbasal one slightly nearer to posterior margin than to median furrow; prozone smooth, mesozone with small round regular granula (separated by about one diameter), between them a fine microsculpture; anterior margin with 4 setae and 1 short preocular seta on each side, 10-12 (rarely 8) setae on posterior margin. Tergites I-X divided, anterior ones granular, posterior ones finely scaly, half-tergites I-III with 4-6 clavate setae, III-IX mostly with 3-5 (rarely 6 or 7) setae, plus a supplementary lateral and a medial anterior seta, last tergite with 2 thin and longer and finely dentate lateral setae and 2 median discal setae: manducatory process laterally granular, with 3 marginal (one tiny suboral one) and

with 2 discal setae, pedipalpal coxa about 22-27 (including one tactile) setae, coxa I 8-14, II 10-14, III 11-16, IV 18-22 (♀ 31-40); spermatheca with two long thin tubes without apical enlargement (Figs 67, 71); genital opening of male with 4-5 internal smooth setae on each side; anterior genital operculum with about 40-45 discal setae in a semicircular double row (setae of second row longest and curved) and a few marginal setae in male, that of female with an oval sclerotized field with 28-35 setae; half-sternite III 4-6+3-4 suprastigmal setae, IV 3-4 (rarely 2)+1, V-X 5-7 (rarely 4 or 8) marginal setae and 1 lateral and 1 medial anterior seta, XI undivided, 6-8 setae (including 2 lateral tactile setae and 2 longer medial discal setae). Anal cone 2+2 setae.

Chelicera: 5 setae on hand, 2 basal ones finely dentate, fixed finger with 3-4 retrorse and 3 distal tiny teeth, movable finger with a triangular subapical lobe, galea of ♂ short, smooth and cone-like, that of ♀ with 3 apical and 2 subapical rami (broken on both chelicerae in holotype), subgaleal seta either reaching past (♂) or not reaching (♀) end of galea, serrula exterior with 20-24 lamellae, rallum of 3 setae, distal one dentate on anterior margin (all broken in holotype).

Pedipalps (Figs 68-69) densely and finely granular, trochanter with a broad and rounded dorsal hump, 1.5-1.9 (♂) (♀ 1.6-1.9) times longer than broad, femur abruptly enlarged at its lateral base, 2.2-2.4 (rarely 2.5-2.6) (♂) (♀ 2.2-2.5) times, patella 2.0-2.4 (♂) (♀ 2.1-2.3) times, club 1.4-1.7 (♂) (♀ 1.5-1.7) times, hand with pedicel 1.3-1.7 (♂) (♀ 1.5-1.7: oblique orientation; holotype: hand in perfectly vertical position: 1.9) times, chela with pedicel 2.2-2.8 (♂) (♀ 2.4-2.8; holotype 3.3) times, without pedicel 2.0-2.6 (♂) (♀ 2.3-2.6; holotype 3.1) times longer than broad (variability seems to be high, but conditioned by the shape of the hand which makes it difficult to take measurements in a perfectly vertical position: lower ratios are obtained in a slightly oblique orientation), hand with pedicel 1.1-1.4 times longer than finger. Chelal fingers frequently gaping (♂ ♀), fixed finger with 31-39 teeth (not countable for holotype) and 4-9 (antiaxial)/2-4 (paraxial) accessory teeth; movable finger with 35-43 teeth (not countable for holotype) and 4-8 (antiaxial)/2-4 (paraxial) accessory teeth; nodus ramosus of venom duct in movable finger level with or proximal to *t*, a thin venom duct reaching *et* in fixed finger; trichobothrial pattern as in Fig. 69, all trichobothria of fixed finger in basal half, except *et*.

One ♂ from Floreana shows only three trichobothria on movable finger of both chelae (*st* being absent); one ♀ from Isabela has only two trichobothria on movable finger of left chela (*sb*, *st* being absent), but the normal number of four trichobothria on the right movable finger; one ♂ from Isabela (same sample: 96-33, leg. S. Peck) possesses three trichobothria on left movable finger (*st* being absent), and only 2 trichobothria (*sb*, *st* being absent) on right finger.

Leg I: femur 1.0-1.3 (♂) (♀ 1.2-1.4) times, patella 2.0-2.4 (♂) (♀ 2.0-2.4) times longer than deep and 1.5-1.9 times longer than femur, tibia 2.7-3.3 (♂) (♀ 2.8-3.5), tarsus 3.7-5.2 (♂) (♀ 3.8-5.1) times longer than deep; leg IV (Fig. 70): femur+patella 2.7-2.8 (1♂ 3.4) (♂) (♀ 2.7-3.1) times, tibia 3.5-4.1 (1♂ 4.5) (♂) (♀ 3.5-4.3) times, tarsus 3.7-4.7 (1♂ 5.0) (♂) (♀ 3.9-4.1) times longer than deep; tarsus with a subbasal sensory dome and a subapical tactile seta (TS=0.67-0.77, length 0.12-0.15 mm), the latter smooth and longer than tarsal breadth; subterminal seta smooth, curved; undivided arolia shorter than smooth claws.

MEASUREMENTS in mm: Holotype: Total length 3.16. Carapace 0.81/0.65. Pedipalps: trochanter 0.38/0.24, femur 0.64/0.30, patella 0.70/0.30, hand with pedicel 0.75/0.39, length of pedicel 0.10, length of finger 0.57, of chela with pedicel 1.28. Leg I: femur 0.20/0.14, patella 0.33/0.14, tibia 0.29/0.09, tarsus 0.30/0.07; leg IV: femur+patella 0.65/0.21, tibia 0.47/0.12, tarsus 0.36/0.09.

9 males (6 females) (from Barrington, Espanola, Fernandina, Floreana, Isabela, Marchena, Santa Cruz, Santiago, Seymour): Total length 1.86-2.59 (2.45-3.28). Carapace 0.71-0.81/0.59-0.66 (0.81-0.87/0.64-0.75). Pedipalps: trochanter 0.32-0.39/0.59-0.66 (0.36-0.40/0.20-0.24), femur 0.53-0.64/0.20-0.26 (0.59-0.64/0.25-0.27), patella 0.51-0.68/0.23-0.29 (0.59-0.68/0.28-0.29), hand with pedicel 0.57-0.68/0.37-0.51 (0.62-0.74/0.41-0.48), length of pedicel 0.08-0.12 (0.07-0.11), of finger 0.48-0.56 (0.48-0.58), of chela with pedicel 0.97-1.15 (1.03-1.22). Leg I: femur 0.15-0.19/0.13-0.15 (1♂ 0.19) (0.17-0.21/0.14-0.16), patella 0.28-0.30/0.11-0.14 (0.30-0.32/0.14-0.15), tibia 0.25-0.28/0.05-0.07 (0.27-0.31/0.09-0.10), tarsus 0.25-0.29/0.05-0.07 (0.26-0.29/0.06-0.07); leg IV: femur+patella 0.53-0.59/0.19-0.22 (1♂ 0.16) (0.60-0.65/0.20-0.23), tibia 0.39-0.45/0.10-0.12 (1♂ 0.09) (0.44-0.47/0.11-0.13), tarsus 0.31-0.35/0.07-0.08 (0.32-0.36/0.07-0.09).

REMARKS: Banks (1902) indicated as type locality "...found within the hollow of a dead twig of a bush in the small, very dry valley at the head of Tagus Cove, Albemarle". The corresponding slide label bears the indication "Iguana Cove". Both localities are on the west coast of Isabela, Tagus Cove in the northern part opposite Isla Fernandina, near Volcano Darwin, Iguana Cove (=Caleta Iguana) lies near Volcano Cerro Azul on the southwestern coast.

An important characteristic of this species seems to be the coloration of the carapace and tergites I/II (dark median macula and whitish lateral zones), but this is not present in all specimens of a given population. Furthermore, the chelal fingers are gaping in many, but not all, specimens (♂ ♀). The shape of the pedipalps is characteristic, but the proportions of the chela are difficult to measure consistently because of the deep hand (a slight inclination will drastically change the length/breadth ratio).

The single male from Cueva Gilberto Moncayo (Santa Cruz) shows all the main characteristics of the species, but it has more slender legs IV. More specimens from this cave should be studied to verify the consistency of this difference.

Nymphal stages of this species can easily be distinguished from those of *P. galapagensis* Beier, 1977 and *P. franzi* Beier, 1978 by the presence of a longer and smooth tactile seta on tarsus IV and by the presence of finely dentate lateral tactile setae on tergite XI, though deutonymphs of *franzi* sometimes possess on tergite XI longer lateral setae that are apically clavate.

***Parachernes (Parachernes) galapagensis* Beier, 1977**

Fig. 72

Parachernes galapagensis Beier, 1977: 106-108, fig. 7 (type locality: Santa Cruz, Turtle Bay, humus dans une crevasse au pied du barranco, à 1 km de la plage).

Parachernes darwiniensis maculosus Beier, 1978: 543-544, fig. 7 (type locality: Pinzon, Südafall des höchsten Gipfels); **syn. n.**

SPECIMENS STUDIED: **Bartolome**: 5♂ 7♀ 7T 8D 7P; littoral, mangrove litter sifting, 28.III.1992, leg. S. Peck (92-63). – 1♂; littoral zone, *Laguncularia racemosa*, *Batis*, *Maytenus*; sifted from litter and sand, 12.II.1985, leg. H. & I. Schatz (85-H9). – 2P; mangroves behind

Pinnacle Rock, littoral zone, 0 m, under *Maytenus octogona*, leaf litter, 11.II.1985, leg. H. & I. Schatz (85-59). – 1 ♀ 1P; mangroves between Pinnacle Rock and island, 0 m, littoral zone, under *Maytenus octogona*, decayed leaf litter and pieces of wood, 12.II.1985, leg. H. & I. Schatz (85-139). – 1T; mangroves near Pinnacle Rock, littoral zone, 0 m, leaf litter and soil, under *Maytenus octogona*, 26.XII.1986, leg. H. Schatz (87-422). – 1 ♀ 2T 2P; mangroves near Pinnacle Rock, 0 m, littoral zone, leaf litter and soil under *Laguncularia racemosa*, 26.XII.1986, leg. H. Schatz (87-G040). – 4P; mangroves near Pinnacle Rock, littoral zone, 0 m, under *Maytenus octogona*, leaf litter and humus, 26.XII.1986, leg. H. Schatz (87-G041). – **Espanola**: 13 ♂ 10 ♀ 3T 6P; Punta Suarez, 10 m, litter under bushes in seabird rookery, 10.VI.1985, leg. S. & J. Peck (85-187). – 1 ♀; Punta Suarez, 30 m, shrub litter, 29.IV.1992, leg. S. Peck (92-144). – **Fernandina**: 39282; 1T; Cabo Hammond, 3-5 m, sweeping in clumps of “salt grass”, 27.IV.1975, leg. W. G. Reeder. – 39370; 1T; 5-10 m, from *Scalesia* solitary in Aa lava near Cabo Hammond, 29-30.IV.1975, leg. W. G. Reeder. – 39267; 1 ♀ 1T; west vegetation strip, 30 m, sweeping in ash delta of stream bed, *Croton*, *Ipomoea*, *Bursera*, *Waltheria*, 11.VIII.1977, leg. W. G. Reeder. – 2 ♂ 1D; 10 km NE Cabo Hammond, 400 m, shady ravine, litter on lava, 8.V.1991, leg. S. & J. Peck (91-125). – 10 ♂ 7 ♀ 3T 5D 3P; Cabo Hammond, 1 m, litter and soil washing under beach hibiscus, 11.V.1991, leg. S. & J. Peck (91-128). – **Floreana**: 1D; highland near caves under Cerro Asilo de la paz, cultivated zone, 340 m, in crevice under *Lantana camara*, leaf litter with roots and humus, 17.I.1987, leg. H. Schatz (87-G051). – **Genovesa**: 1D; Arcturus Lake, 20 m, littoral zone, under *Rhizophora mangle*, decayed leaf litter and black soil, 16.II.1985, leg. H. & I. Schatz (85-60). – **Isabela**: RBINS; 1 ♂; 12.III.1974, leg. S. Jacquemart (139). – 39261; 7 ♂ 5 ♀ 4D 2P; Volcan Alcedo, eastern slope, 790 m, screened from eight finch and two mockingbird nests in *Zanthoxylum*, 5-7 ft above ground, *Cassia*, *Ipomoea*, *Tournefortia*, 14.V.1980, leg. W. G. Reeder. – 39369; 1 ♂; Cabo Berkeley, 40-140 m, under ash plates and lava erratics, organo del burro, *Waltheria*, *Tribulus*, *Boerhavia*(?), 8.VIII.1977, leg. W. G. Reeder. – 39334; 1T; 1 km S of Cerro Verde, 320 m, screened from organic soil at base of lava blocks, latter covered by ferns and moss, *Peperomia*, 16.I.1978, leg. W. G. Reeder. – 1 ♀ 1D; Santo Tomas, humid forest, FIT, 4-15.III.1989, leg. S. Peck & B. J. Sinclair (89-100). – CDRS; 1 ♀; Volcan Alcedo, 1125 m, 24.VI.1991, bajo piedras, leg. S. Abedrabbo. – **Marchena**: RBINS; 1 ♂; near fumaroles, 21.II.1974, leg. S. Jacquemart (97B); – 14 ♂ 16 ♀ 11T 5D 12P; SW Playa, littoral, *Cryptocarpus*, soil wash, 23.III.1992, leg. S. Peck & J. Cook. – **North Plazas**: TNSC 39259, 39310; 1 ♀ 4T 1P; 5 m, sweeping in *Sesuvium-Opuntia-Scutia* association, 20.X.1975, leg. W. G. Reeder. – 39318; 1 ♂ 1 ♀ 1T 2D; 5 m, sweeping in *Maytenus* and *Castela*, *Opuntia-Castela-Scutia* association, 20.X.1975, leg. W. G. Reeder. – **Pinta**: ♂ 11 ♀ 3T 2D 1P; littoral zone, *Cryptocarpus* litter, Berlese, 21.III.1992, leg. J. Cook & S. Peck (92-56). – **Pinzon**: TNSC 39375; 1 ♀; Union, screened in litter, area of *Lantana*, *Prosopis*, *Croton*, *Cordia*, 14.II.1974, leg. D. & D. Clark. – 39265; 1 ♂ 1 ♀; 120 m, finch nest of lichen in *Scalesia incisa*, 2 m from ground, surrounding mostly *Lantana*, very dry, 2.II.1979, leg. W. G. Reeder. – RBINS; 1T; bord du cratère, 22.VI.1975, leg. H. Franz (SA 331). – 3 ♂ 2 ♀ 7T 5D 7P; SE slope, 380 m, “pampa”, litter sifting, 27.VI.1991, leg. S. Peck (91-255). – 1P; Central valley, Upper Dry zone, 270 m, *Croton scouleri* forest with *Lantana peduncularis*, *Acacia macracantha*, *Cordia leucophlyctis*, under *Croton* at different localities, decayed litter and fine humus, 31.I.1987, leg. H. Schatz (87-G054). – **Rabida**: TNSC 39373; 2 ♂; north slope, 600 ft, screened litter of *Maytenus* and *Opuntia*, sweep netting of *Maytenus*, *Bursera-Croton-Lantana* assoc., dry substrate, 29.IX.1975, leg. W. G. Reeder. – 39309; 2 ♀ 2T; north slope, 600-900 ft, from 4 dismantled nests (3 finch, 1 mockingbird) in *Maytenus-Croton*, 29.IX.1975, leg. W. G. Reeder. – 39299; 2 ♂ 4 ♀ 1T 1D; north slope, 900 ft, screening of *Opuntia* litter, sweeping of *Maytenus*, dry cobble substrate, *Bursera*, *Croton*, *Lantana*, *Castela*, 29.IX.1975, leg. W. G. Reeder. – 39363; 1 ♂ 1 ♀; north slope summit, 1200 ft, sifted from very dry litter of ferns, *Opuntia* and *Chamaesyce*, rocky cobble substrate, 29.IX.1975, leg. W. G. Reeder. – 1 ♂ 1 ♀; north flamingo lagoon, littoral zone, 5 m, mangrove litter and humus under *Avicennia germinans*, 25.XII.1987, leg. H. Schatz (87-G039). – **Santa Cruz**: RBINS; 1 ♀; Los Gemelos, *Scalesia* zone, 570 m, 25.I.1974, leg. J. Jacquemart (39). – MHNG; 1 ♀; Los Gemelos, pitfall trap, 17.XII.1997, don. L. Baert. – CDRS; 1 ♂ 4D; *Scalesia* zone, soil sample, Berlese, 21.V.1986, leg. S. Abedrabbo. – 39364; 1 ♀; SW base of Cerro Colorado, suction sample from *Scalesia*, 200-300 m, cracker on lava ridge, 13.III.1975, leg. W. G. Reeder. – 39292; 1T 2D; north slope, 700 m, sweeping in *Scalesia* understorey,

Tournefortia, ferns of forbs, *Chiococca* very common, 4.V.1980, leg. W. G. Reeder. – 1♂; Puntudo, 700 m, pampa zone, shrub litter, 2.II.1989, leg. S. Peck (89-29). – 1♀ 1T; Tortuga Bay, 1 m, litter on sand under machineel, 30.I.1989, leg. S. Peck (89-23). – 1♂; CDRS, backbeach, under *Sesuvium* litter, 29.I.1989, leg. S. Peck (89-3). – 1♂ 1T 1P; Puerto Ayora, Tortuga Bay, brackish litter under machineel, 0.5 m, 29.VI.1991, leg. S. Peck (91-258). – 1P; *Scalesia* forest near Cerro Crocker, *Scalesia* zone, 700 m, *Lycopodium dichotomum* on *Zanthoxylum fagara*, *Lycopodium* pads on bough with roots and mosses, 6.III.1987, leg. H. Schatz (87-G069). – 1D; forest near Los Gemelos, *Scalesia* zone, 600 m, *Scalesia pedunculata*, *Zanthoxylum fagara*, *Tournefortia rufo-sericea* and *Psychotria rufipes*, 8.III.1987, leg. H. & I. Schatz (87-G073). – **Santa Fé**: 39277; 3♀ 1D; second barranco 1 km SSW of Camp Bay, fallen *Opuntia* trunk, very dry, *Croton-Cordia* association, 24.I.1979, leg. W. G. Reeder. – 2♂; rock outcrops of second barranco 1 km SSW of Camp Bay, 100 m, litter of *Cordia* and *Croton*, sheltered but very dry, 24.I.1979, leg. W. G. Reeder. – 39257; 1D; second barranco, SSW of Camp Bay, 100 m, from dry *Opuntia* pads, substrate of rocks and sand, 24.I.1979, leg. W. G. Reeder. – 1♀ 1D; littoral, *Cryptocarpus* litter, 6.IV.1989, leg. S. Peck (89-193). – **Santiago**: 39376; 1♂; crater area, 850 m, screening of litter (*Tournefortia* and *Zanthoxylum* leaves, moss, around water source), 16.IX.1975, leg. W. G. Reeder. – 39374; 2♂ 1T 1D; crater area, 850 m, screened from moss and dead wood, *Zanthoxylum* around water source, 16.IX.1975, leg. W. G. Reeder. – 39360; 1♀; crater area, 830 m, under tent fly in garua, *Zanthoxylum savana*, 14.IX.1975, leg. W. G. Reeder. – 39372; 1♂; lower southern crater, 750 m, sweeping in *Tournefortia* and cafetillo, *Zanthoxylum* dominant, N.W. Crater rim, 22.IX.1975, leg. W. G. Reeder. – 39361; 1♂; lower crater, 750 m, sweeping in ferns, *Tournefortia*, *Zanthoxylum*, *Perperonia* in damp depression, SE crater rim, 22.IX.1975, leg. W. G. Reeder. – **Seymour**: 1P; interior of island, dry zone under *Parkinsonia aculeata* and *Bursera malacophylla*, grass litter, 10 m, 11.II.1985, leg. H. & I. Schatz (85-57). – RBINS/MHNG; 27♂ 22♀ 5T 7D 11P; litter under bushes in frigatebird rookery, 1 m, 23.I.1989, leg. S. Peck (89-20). – **South Plazas**: 39255; 1♂; 15 m, damp litter under *Maytenus*, fully shaded, surface to 10 cm depth, 20.III.1975, leg. W. G. Reeder. – 1♂ 2♀ 3T 1D; arid shrubs and succulent litter, 6.V.1992, leg. S. Peck (92-162).

SHORT DESCRIPTION (measurements of pedipalps based on 15♂ 11♀ from Barrington, Espanola, Fernandina, Isabela, Marchena, North Plazas I., Pinzon, Rabida, Santa Cruz, Santiago, Seymour, South Plazas). Carapace brown, a darker, roughly trapezoid or oval, median spot, lateral whitish spots not tapering to lateral margin; tergite I unsclerotized, the following ones brown, with a dark median spot in each half. Carapace 1.0-1.2 longer than broad, mesozone with round regular granula separated by about their diameter, between them microgranular sculpturing, 4 setae +1/1 preocular setae on anterior margin, 7-13 on posterior one (some submarginal ones); tergites divided, chaetotaxy similar to *P. nigrimanus*, tergite XI with 7-12 clavate and dentate setae (2 discal ones). Chaetotaxy of coxae similar to that of *P. nigrimanus*, male genital opening with 3-5 smooth internal setae on each side; spermatheca with two tubes with apical oval enlargements (Fig. 72); anterior genital operculum of ♂ with about 30-47 long, smooth, curved setae (in semicircular arrangement), that of ♀ with a round field of 24-32 setae; sternites divided, chaetotaxy similar to that of *P. nigrimanus*, half-sternite III 2-4+2-3 suprastigmal setae, IV 2-4+1, sternite XI with 5-7 setae, lateral ones slightly longer and dentate. Chelicera with 5 setae, *ib* finely dentate (rarely both basal setae finely dentate); galea of male stout, with 6 subapical and apical branchlets, that of female more slender, with 4-6 subapical/apical branchlets, rallum with 3 setae, serrula exterior with 18-22 lamellae.

Pedipalps: trochanter with rounded dorsal hump, 1.6-1.9 (♂ ♀) times longer than broad, femur basolaterally obliquely enlarged, 2.5-2.9 (♀ 2.4-2.8) times, patella 2.1-2.5 (♀ 2.2-2.5) times, club 1.5-1.9 (♀ 1.6-1.8) times, hand with pedicel 1.5-1.8

(♀ 1.5-1.8) times longer than broad and 1.2-1.5 (♀ 1.2-1.7) times longer than finger, chela with pedicel 2.5-3.2 (♀ 2.4-3.1) times, without pedicel 2.3-3.0 (♀ 2.2-2.9) times longer than broad; fingers not gaping, fixed finger with 22-41 teeth and 4-8 (anti-axial)/2 (paraxial) accessory teeth; movable finger with 29-45 teeth, plus 3-10/1(0 one chela) accessory teeth; venom duct long, nodus ramosus slightly proximal to *t*, a short, thin venom duct present in fixed finger, reaching level of *et*.

Leg I: femur 1.3-1.6 (♀ 1.4-1.6) times longer than deep and 1.4-1.6 (♀ 1.5-1.6) times longer than patella, patella 2.1-2.6 (♀ 2.1-2.6) times, tibia 3.0-3.8 (♀ 2.9-3.7) times, tarsus 4.4-5.7 (♀ 4.5-5.2) times longer than deep; leg IV: femur+patella 3.1-3.5 (♀ 3.3-3.6) times, tibia 3.8-4.8 (♀ 3.8-4.8) times, tarsus 4.4-5.4 (♀ 4.4-4.8) times longer than deep; tarsus with short pseudotactile seta (as long as tarsus depth, length 0.05-0.07 mm) (TS=0.70-0.79), with one subapical denticle on dorsal face; simple arolium shorter than smooth claws.

MEASUREMENTS of ♂ (♀): Total length 1.6-2.2 (2.1-3.5). Carapace 0.61-0.73/0.53-0.82 (0.59-0.74/0.51-0.64). Pedipalps: trochanter 0.29-0.37/0.16-0.22 (0.29-0.39/0.15-0.24), femur 0.48-0.63/0.18-0.23 (0.46-0.68/0.19-0.28), patella 0.47-0.63/0.20-0.26 (0.46-0.68/0.20-0.28), hand with pedicel 0.49-0.57/0.31-0.37 (0.52-0.69/0.32-0.43), length of pedicel 0.06-0.07 (0.06-0.09), of finger 0.35-0.49 (0.31-0.51), of chela with pedicel 0.82-1.05 (0.80-1.19). Leg I: femur 0.15-0.21/0.10-0.13 (0.14-0.21/0.11-0.14), patella 0.23-0.31/0.07-0.08 (0.21-0.33/0.11-0.13), tibia 0.22-0.31/0.07-0.08 (0.21-0.31/0.07-0.08), tarsus 0.23-0.29/0.05-0.06 (0.23-0.31/0.05-0.06); leg IV: femur+patella 0.44-0.59/0.14-0.17 (0.43-0.64/0.13-0.20), tibia 0.33-0.47/0.08-0.10 (0.32-0.51/0.08-0.11), tarsus 0.27-0.37/0.06-0.07 (0.27-0.36/0.06-0.08).

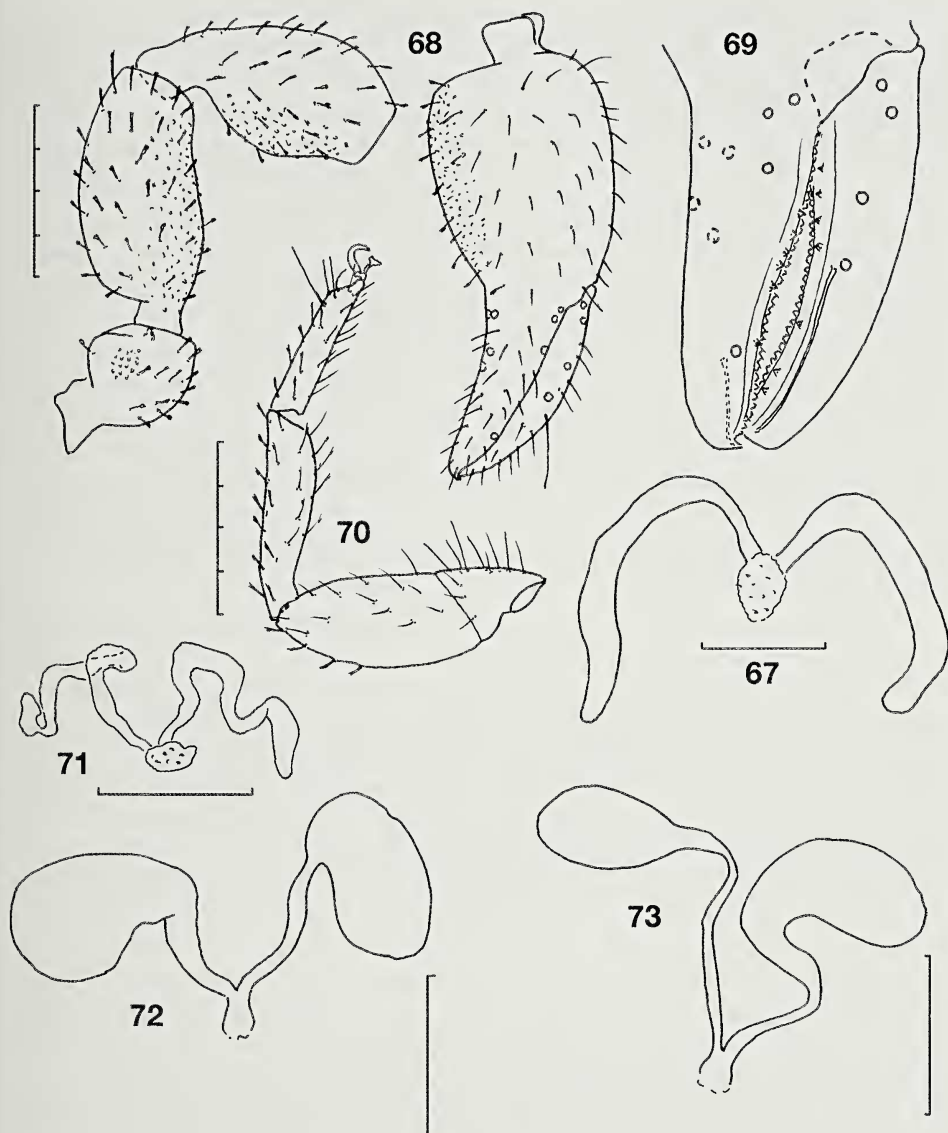
REMARKS: Beier (1977) recorded this species from Isabela-Sud. Specimens of *P. franzi* and *P. galapagensis* show a certain variability in proportions and measurements of their pedipalps. Normally they can be separated by the palpal ratios (*P. franzi* having in the average more slender segments), combined with the shape of the lateral whitish spots of the posterior margin of the carapace, but the identification of single specimens might be problematic.

***Parachernes (Parachernes) franzi* Beier, 1978**

Fig. 73

Parachernes franzi Beier, 1978: 544-545, fig. 8 (type locality: Pinta, Wald mit *Scalesia* and Espinoso nahe dem Gipfel).

SPECIMENS STUDIED: **Fernandina:** 39279; 1 ♀; *Lantana* area, Bursera Hills, trail from Cabo Hammond to crater, 125 m, sweepnet of herbs and shrubs, *Bursera*, *Croton*, 27.IV.1975, leg. W. G. Reeder. – 73192; 1 ♂ 1 ♀; Bursera Hills, trail from Cabo Hammond to crater, 125 m, litter sifting under *Zanthoxylum*, *Bursera*, *Croton*, all dry, 20.IV.1975, leg. W. G. Reeder. – 39302; 1 ♂ 1T 2D; west vegetation strip, 30 m, sweeping in *Scalesia* area, with *Bursera*, *Scutia*, *Waltheria*, Aa lava and ash substrate, 10.VIII.1977, leg. W. G. Reeder. – 39267; 1 ♀; west vegetation strip, 30 m, sweeping in ash delta of stream bed, *Croton*, *Ipomoea*, *Bursera*, *Waltheria*, 11.VIII.1977, leg. W. G. Reeder. – 39280; 1 ♀ 2T; west vegetation strip, 390 m, remnant of *Psychotria* forest, *Zanthoxylum*, *Tournefortia rufo-sericea*, *Psychotria*, *Cyperus*, grass, sweeping, 14.VIII.1977, leg. W. G. Reeder. – **Genovesa:** 1 ♂ 2D 1P; Bahia Darwin, 1 m, back-beach, litter washing, 27.III.1992, leg. J. Cook & S. Peck. – **Isabela:** RBINS; 1 ♀ 3T 2D; Volcan Alcedo, no date, leg. S. Jacquemart (I.G. 24965). – RBINS; 2 ♀; Volcan Alcedo, Geyser pools, 900 m, 12.III.1974, leg. S. Jacquemart (130, 131). – 39338; 1 ♀; above Santo Tomas, 480 m, screened from litter of *Scalesia* and fern (away from guajava), 19.I.1978, leg. W. G. Reeder. –



FIGS 67-73

Parachernes nigrimanus (Banks, 1902), ♀ (Santa Cruz) (67-71), (67, 71-73) Spermathecae, *P. nigrimanus*, ♀ from Santa Cruz (67), holotype (71), *P. galapagensis* Beier, 1977 (Espanola) (72), *P. franzi* Beier, 1978 (Isabela) (73). (68) Left pedipalp. (69) Trichobothrial pattern. (70) Leg IV. Scale units 0.1 mm.

39345; 1♂ 2♀; Sierra Negra, W slope canyon, 800 m, sweeping in fern and *Darwiniothamnus*, 25.I.1978, leg. W. G. Reeder. - 38943; 1♂; Volcan Alcedo, Pega Pega Camp, screened from leaf litter in crotches and around trunks of *Pisonia*, 14.V.1980, leg. W. G. Reeder. - 61383; 1♂; Volcan Alcedo, tributary barranco, 735 m, sweeping in *Alternanthera*, *Darwiniothamnus*, *Adiantum* fronds and roots, 15.V.1980, leg. W. G. Reeder. - **Marchena**: RBINS; 1♀ 1P; sommet du cratère, 21.II.1974, leg. S. Jacquemart (98). - 39344; 1♂ 2♀ 1D; SW slope beach camp area,

15 m, old dry finch nest in *Chamaesyce*, 0.5 m above ground, 25.I.1977, leg. W. G. Reeder. – 39322; 1♂; SW slope, fumarole area, 175 m, screened from damp *Cyperus* litter, 3rd fumarole from top, 26.I.1977, leg. W. G. Reeder. – 39301; 1♀ 1D; south ridge, 220 m, under bark scales of old *Bursera*, understorey of *Lantana* and *Croton*, 28.I.1977, leg. W. G. Reeder. – 39332; 1♂ 2D; south slope, 190 m, sifting of dry litter of *Bursera* near fumarole ridge, 26.I.1977, leg. W. G. Reeder. – 39313; 1♀ 1D; SW slope, trail to fumaroles, 100 m, screening of litter of *Waltheria* and carillo de caballo, bottom of lava canyon, dry but protected, 26.I.1977, leg. W. G. Reeder. – 39307; 1♀; south slope, 190 m, near fumarole ridge, but dry, sweeping in *Lantana*, *Chamaesyce*, *Croton*, *Waltheria* and carillo de caballo, 28.I.1977, leg. W. G. Reeder. – 39292; 1♀; Kipouka, 150 m, sweeping in *Chiococca*, *Lantana*, vinous legume, *Waltheria*, *Bursera* community, 29.I.1977, leg. W. G. Reeder. – **Pinta**: RBINS; 2♂ 2D 1P; prairie sèche, 28.II.1974, leg. S. Jacquemart (113, 115). – 39268; 2♂ 2♀ 1T 1D; south slope, 450 m, sweeping in trees and shrubs, *Psychotria*, *Pisonia*, *Croton*, *Zanthoxylum*, *Tournefortia*, *Commelina*, grasses, 20.I.1977, leg. W. G. Reeder. – 39312; 1D; south slope, 380 m, sweeping in *Passiflora*, *Darwiniothamnus*, grass, *Tournefortia*, 20.I.1977, leg. W. G. Reeder. – 39248; 1♀ 1T 2D; south slope, 550 m, sweeping in *Psychotria*, *Zanthoxylum*, *Salvia*, *Tournefortia*, 23.VII.1977, leg. W. G. Reeder. – 39284; 1♀; near summit, 625 m, screening of litter, highest *Zanthoxylum* forest with *Tournefortia*, ferns contributing, 23.VII.1977, leg. W. G. Reeder. – 39253; 1♂ 2♀; summit crater, 640 m, sweeping in wet *Pteridium*, *Tournefortia* on floor of small crater, 20 m into fern zone, 22.VII.1977, leg. W. G. Reeder. – 39254; 1T 1D; south slope, 550 m, screened from finch nest 1.5 m above ground in *Zanthoxylum*, *Psychotria*, *Zanthoxylum* community, 23.VII.1977, leg. W. G. Reeder. – **South Plazas**: 39262; 1♀; 10-12 m, screening of damp litter under *Opuntia* pad and rotting *Opuntia* stump base, 19.III.1975, leg. W. G. Reeder.

SHORT DESCRIPTION (measurements of pedipalps based on 6♂ 13♀ from Bartolome, Fernandina, Isabela, Marchena, North Plazas Is., Pinta, Pinzon, Santiago, South Plazas). Carapace brown, a darker, roughly trapezoid, median spot near posterior margin, lateral whitish spots tapering to lateral margin, tergite I unsclerotized, the following ones brown, with a median dark spot in each half. Carapace 1.0-1.2 longer than broad, mesozone with round, regular granula separated by about their diameter, between them microgranular sculpturing, 4 setae +1/1 preocular setae on anterior margin, 7-11 on posterior one; tergites divided, chaetotaxy similar to that of *nigrimanus*, tergite XI with 8 clavate and dentate setae (2 discal ones). Chaetotaxy of coxae similar to that of *P. nigrimanus*, male genital opening with 3-4 smooth internal setae on each side; spermatheca with two tubes leading to oval apical enlargements (Fig. 73); anterior genital operculum of ♂ with about 34 long, smooth, curved setae (in semi-circular arrangement), that of ♀ with a round field of 20-30 setae; sternites divided, chaetotaxy similar to that of *P. nigrimanus*, sternite XI with 6 (7) setae, lateral ones slightly longer and dentate. Chelicera with 5 setae (*ib* finely dentate; rarely both basal setae finely dentate), galea of male stout, with 6 subapical/apical branchlets, that of female more slender, with 6 subapical/apical branchlets, rallum with 3 setae, serrula exterior with 18-20 lamellae.

Pedipalps: trochanter with rounded dorsal hump, 1.7-1.8 times longer than broad, femur basolaterally obliquely enlarged, 2.5-2.9 (♀ 2.6-3.3) times, patella 2.4-2.6 (♀ 2.3-2.7) times, club 1.8-1.9 (♂ ♀) times, hand with pedicel 1.8-1.9 (♀ 1.8-2.0) times longer than broad and 1.2-1.3 (♀ 1.3-1.6) times longer than finger, chela with pedicel 3.1-3.3 (♀ 2.8-3.3) times, without pedicel 2.9-3.0 (♀ 2.7-3.0) times longer than broad; fingers not gaping, fixed finger with 33-42 teeth and 3-10(!) (antiaxial)/2-3 (paraxial) accessory teeth; movable finger with 34-37 teeth and 2-8/(0, one chela)/1-2 accessory teeth; venom duct long, nodus ramosus slightly proximal to *t*, a thin, short venom duct present in fixed finger, reaching *et*.

Leg I: femur 1.5-1.6 times longer than deep and 1.5-1.6 times longer than patella, patella 2.4-2.8 times, tibia 3.2-3.7 (♀ 3.6-4.2) times, tarsus 5.6-5.9 (♀ 5.1-5.7) times longer than deep; leg IV: femur+patella 3.3-3.5 (♀ 3.4-3.9) times, tibia 4.4-4.5 (♀ 4.4-5.0) times, tarsus 5.0-5.6 (♀ 4.8-5.3) times longer than deep; tarsus with short pseudotactile, finely dentate (one denticle) seta (as long as tarsus depth); simple arolium shorter than smooth claws.

MEASUREMENTS of ♂ (♀): Total length 1.8-2.9 (♂ ♀). Carapace 0.66/0.66 (0.69/0.83). Pedipalps: trochanter 0.33-0.34/0.18-0.19 (0.34-0.41/0.19-0.23), femur 0.51-0.61/0.18-0.23 (0.56-0.72/0.21-0.22), patella 0.51-0.59/0.19-0.25 (0.54-0.67/0.22-0.25), hand with pedicel 0.55-0.60/0.29-0.34 (0.62-0.77/0.31-0.39), length of pedicel 0.07-0.08 (0.08-0.09), of finger 0.43-0.49 (0.42-0.52), of chela with pedicel 0.90-1.03 (1.00-1.23). Leg I: femur 0.17-0.18/0.12 (0.18-0.23/0.11-0.15), patella 0.26-0.28/0.11-0.12 (0.27-0.35/0.10-0.13), tibia 0.26-0.27/0.07-0.08 (0.25-0.34/0.07-0.09), tarsus 0.30-0.32/0.05 (0.26-0.37/0.05-0.06); leg IV: femur+patella 0.50-0.51/0.14-0.16 (0.52-0.71/0.15-0.17), tibia 0.39-0.40/0.09 (0.41-0.56/0.08-0.11), tarsus 0.33-0.36/0.06-0.07 (0.30-0.43/0.06-0.08).

REMARKS: Beier (1978) recorded this species from the islands of Isabela (Volcan Sierra Negra, 900 and 1000 m) and Marchena (Palo-Santo-Wald mit Opuntien, Gesiebe aus morschem Palo-Santo-Stamm).

Parachernes sp.

SPECIMENS STUDIED: **Floreana**: RBINS; 1P; Black Beach, *Cryptocarpus* litter, 24.III.1989, leg. S. Peck (89-149). – **Isabela**: RBINS; 1T; 4 km NW Santo Tomas, 500 m, moss in forest, litter, 14.III.1989, leg. S. Peck (89-129). – **Pinta**: RBINS; 1T; alt. 540 m, 20-22.III.1986, leg. L. Baert, J.-P. Maelfait & K. Desender (B.86/141).

REMARK: The immature specimens could not identified to species level. Considering the length of the tarsal pseudotactile seta, they either belong to *P. galapagensis* or to *P. franzi*.

WITHIIDAE

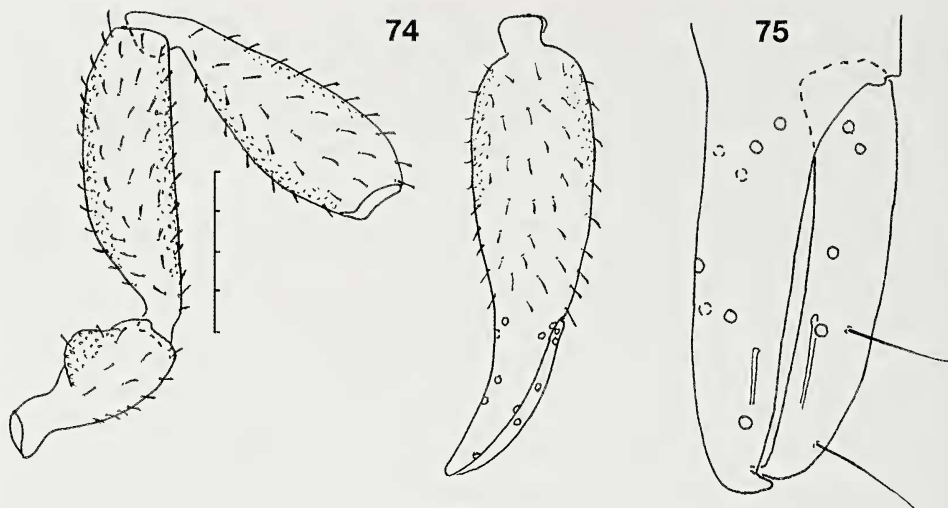
Withius piger (Simon, 1878)

Figs 74-75

Chelifer piger Simon, 1878: 148-149 (Algeria).

SPECIMENS STUDIED: **Santa Cruz**: 39342; 1T; CDRS, buildings, 1978, leg. W. G. Reeder(?). – 8♂ 3♀ 4T 2D; CDRS, 10 m, tortoise dung and hay, 7.II.1989, leg. S. Peck (89-36). – 1♀; Puntudo, 700 m, pampa zone, horse dung, 8.II.1989, leg. S. Peck (89-42).

SHORT DESCRIPTION (based on 4♂ 1♀): Sternites: stigmata of sternite III with 2-3 setae, those of IV with 2-4 (frequently 3) setae; glandular setae arranged in triangular patches on male half-tergites: IV 5-10, V 20-32, VI 28-37, VII 31-35, VIII 24-42, IX 13-25, X 0-2; ♀: half-sternites V-X with 1-2 glandular setae each. Chelicera: hand with 5 setae, the two basal ones apically dentate; galea of ♂ short, with 3 or 4 tiny apical teeth, that of ♀ long, with 6 apical/subapical branchlets; serrula exterior with 16-18 lamellae, rallum with 4 setae, the anteriormost dentate. Pedipalps (♂) (Figs 74-75): femur 3.1-3.5 (♀ 2.9) times, patella 2.8-3.2 (♀ 2.5) times, hand with pedicel 2.2-2.6 (♀ 2.1) times, chela with pedicel 3.6-3.9 (♀ 3.2) times longer than broad, hand with pedicel 1.4-1.6 (♀ 1.5) times longer than finger; chelal finger slightly gaping



FIGS 74-75

Withius piger (Simon, 1878), ♂. (74) Left pedipalp. (75) Trichobothrial pattern. Scale units 0.1 mm.

(indistinctly in ♀); fixed finger with 28-31 (♀ 25) broad cusped teeth, movable finger with 31-35 (♀ 29) marginal teeth and one distal lateral one; trichobothrium *ist* in dorsal, *it* in paraxial position, *est* level with *it*. Leg IV (♂ ♀): femur+patella 2.8-3.0 times, tibia 3.7-4.2 times, tarsus 4.5-5.0 times longer than deep, tibia 1.29-1.37 times longer than tarsus, tarsus with long tactile seta in middle (TS=0.54-0.60); undivided arolia nearly as long as smooth claws.

MEASUREMENTS in mm of ♂ (♀): Pedipalps: femur 0.60-0.77/0.19-0.23 (0.58/0.20), patella 0.63-0.80/0.22-0.25 (0.59/0.23), hand with pedicel 0.61-0.78/0.27-0.30 (0.63/0.30), length of pedicel 0.08-0.09 (0.07), of movable finger 0.42-0.49 (0.42), of chela with pedicel 0.97-1.17 (0.97). Leg IV (♂ ♀): femur+patella 0.51-0.62/0.18-0.22, tibia 0.42-0.48/0.10-0.11, tarsus 0.30-0.35/0.06-0.07.

REMARKS: The specimens correspond in most details to the descriptions given by Vachon (1970) and Heurtault (1971a, b). Males from Santa Cruz show a more slender pedipalpal patella, being as slender as that of *Withius rebieri* Heurtault, 1971. Vachon (1970) indicated for the type specimen of *W. piger* a patella 2.65 times longer than broad. The introduction of this species to Santa Cruz has probably taken place quite recently, since its presence is limited to the Charles Darwin Research Station, the tritonymph found on horse dung might have been transported by a horse.

I also attribute to *Withius piger* several specimens (5 ♂), collected from Bermuda (Somerset Island, leg. R. Schuster, in forest near "alter Bahnstrasse", 6.IX.1981), for which the pedipalpal patella is 2.69-3.06 times longer than broad. The species is of cosmopolitan distribution, and it is here recorded for the first time from the Galapagos archipelago and from Bermuda.

Identification key to adults of the pseudoscorpion species recorded from Galapagos

- 1a Chelal fingers without venom apparatus; trichobothrium *xs* present on fixed chelal finger, legs I/II with one, III/IV with two tarsal articles (Chthonioidea) 2
- 1b One or both chelal fingers with venom apparatus; trichobothrium *xs* absent on fixed chelal finger; all legs with equal number of tarsal articles . . . 8
- 2a Dorsum of chelal hand with two trichobothria (Chthoniidae) 3
- 2b Dorsum of chelal hand with 4 trichobothria (Lechtyiidae) *Lechytia chthoniiformis*
- 3a Coxal spines present on coxae II only 4
- 3b Coxal spines present on coxae I and II *Pseudochthonius galapagensis*
- 4a Pedipalpal hand with at least two long spine-like setae on distal paraxial face; eyes distinct 5
- 4b Pedipalpal hand with only one long and thin seta on distal paraxial face; eyes indistinct *Tyrannochthonius albidus*
- 5a Large species, length of pedipalpal chela at least 1.0 mm; teeth on movable chelal finger flattened, retrorse and densely set 6
- 5b Small species, length of pedipalpal chela at most 0.90 mm (δ \textasciitilde \textasciitilde); teeth of movable finger straight and distinctly spaced; pedipalpal femur 4.6 times (\textasciitilde)-5.1 times (\textasciitilde) longer than broad . . . *Paraliochthonius litoralis* sp. n.
- 6a Pedipalpal femur 4.7-5.2 times, patella 2.1-2.3 times longer than broad 7
- 6b Pedipalpal femur 5.6-6.1 times, patella 2.5-2.6 times longer than broad; length of chela 1.47 mm (\textasciitilde \textasciitilde) *Paraliochthonius galapagensis* sp. n.
- 7a Pedipalpal femur 0.69-0.80 mm long, hand 1.75-1.81 times (length 0.35-0.42 mm) longer than deep, chela 5.0-5.2 times longer than deep, length \textasciitilde 1.02-1.12 mm, \textasciitilde 1.08-1.20 mm *Paraliochthonius rupicola* sp. n.
- 7b Pedipalpal femur 0.84-0.96 mm, hand 1.9-2.0 times (length 0.45-0.51 mm), chela 5.4-5.7 times longer than deep, length \textasciitilde 1.26-1.34 mm, \textasciitilde 1.32-1.45 mm *Paraliochthonius pecki* sp. n.
- 8a Movable cheliceral finger with several teeth; seta *gs* submedial; trichobothrium *t* on movable chelal finger lanceolate (Syarinidae) 9
- 8b Movable cheliceral finger with 1-2 subapical teeth; seta *gs* subdistal; trichobothrium *t* on movable chelal finger fine, simple 10
- 9a Large species with slender pedipalps, femur 2.9-3.0 times longer than broad (length 0.58-0.59 mm), chela with pedicel 2.9 times longer than broad (length 0.94-0.97 mm) *Ideoblothrus galapagensis* sp. n.
- 9b Small species with stout pedipalps, femur 2.5-2.6 times longer than broad (length 0.32-0.39 mm), chela with pedicel 2.3-2.6 times longer than broad (length 0.54-0.66 mm) *Ideoblothrus emigrans* sp. n.
- 10a Carapace subtriangular, posteriorly distinctly broader than anteriorly; long cucullus present, eyes situated away from anterior margin of carapace 11
- 10b Carapace parallel-sided; long cucullus absent, eyes situated near anterior margin of carapace 13

- 11a Four eyes present; large species, femur length at least 1.13 mm (Garypidae) *Garypus granosus* sp. n.
- 11b Two eyes; small species, femur length about 0.30 mm (Cheiridiidae) 12
- 12a Movable chelal finger with one trichobothrium; posterior margin of carapace and anterior tergites without protruding granula *Neocheiridium galapagoense*
- 12b Movable chelal finger with 2 trichobothria; posterior margin of carapace and anterior tergites with protruding granula *Cryptocheiridium confundens* sp. n.
- 13a Spermatheca absent; pedipalpal femur with 1-2 tactile setae; legs with two tarsal segments 14
- 13b Spermatheca present; pedipalpal femur without trichobothria; legs with only one tarsal segment 21
- 14a Tergites undivided; tarsal arolia undivided (Olpiidae) 15
- 14b Tergites divided; tarsal arolia divided (Garypinidae) 17
- 15a Trichobothrium *est* halfway between *ist/it* and *isb*; chelal hand cordiform, fixed chelal finger distinctly longer than hand with pedicel; setae on tergite XI forked 16
- 15b Trichobothrium *est* distinctly nearer to *it/ist* than to *isb*; chelal hand not cordiform; fixed chelal finger as long as hand with pedicel; setae on tergite XI simple *Stenolpium insulanum*
- 16a Large species; length of pedipalpal femur 0.61-0.81 mm, of patella 0.51-0.69 mm, of chela with pedicel 1.03-1.46 mm . . . *Aphelolpium longidigitatum*
- 16b Smaller species; length of pedipalpal femur 0.45-0.54 mm, of patella 0.35-0.45 mm, of chela with pedicel 0.71-0.93 mm . . . *Aphelolpium cayanum*
- 17a Pedipalpal chela with normal number of trichobothria (8 on fixed, 4 on movable finger) 18
- 17b Pedipalpal chela with reduced number of trichobothria (7 on fixed finger, 2 on movable finger) *Galapagodinus franzi*
- 18a Arolia distinctly longer than claws, divided for half of total length; cheliceral hand with 5 setae 19
- 18b Arolia barely longer than claws, divided for one third of total length; cheliceral hand with 4 setae *Serianus maritimus* sp. n.
- 19a Pedipalps stout, femur 2.8-3.4 times, chela with pedicel 2.9-3.6 times longer than broad 20
- 19b Pedipalps slender, femur 4.8 times, chela with pedicel 5.2 times longer than broad *Serianus elongatus* sp. n.
- 20a Tergites I/II with 4-6, tergites III-V with 5-6, tergites VI-X with 7-8 marginal setae *Serianus* cf. *galapagoensis*
- 20b Tergites I-V with 4, VI-X with 6 marginal setae *Serianus galapagoensis*
- 21a Male sternites with patches of glandular setae; female sternites V-VIII with a median pair of glandular setae; junction between femur/patella of legs I and II perpendicular (Withiidae) *Withius piger*
- 21b Male sternites without patches of glandular setae; female sternites V-VIII without a pair of glandular setae; junction between femur/patella of legs I and II oblique 22

- 22a Venom apparatus present in movable finger; tarsi proximally with raised slit sensillum; chelal fingers normally with at least one accessory tooth (Chernetidae) 23
- 22b Venom apparatus only present in fixed chelal finger; tarsi proximally without raised slit sensillum; chelal fingers without accessory teeth (Atemnidae) *Paratemnoides nidificator*
- 23a Trichobothrium *est* of fixed chelal finger on level with *ist/it* *Rhopalochernes insulanus*
- 23b Trichobothrium *est* distinctly proximal to *ist/it* 24
- 24a Pseudotactile seta of tarsus of leg IV finely dentate near apex, shorter than, or as long as, depth of tarsus; tergite XI with two clavate lateral setae; pedipalps slender (femur at least 2.5 times longer than broad), pedipalpal femur obliquely enlarged basolaterally; spermatheca consisting of two tubes with ovoid apical enlargements 25
- 24b Tactile seta of leg IV smooth, distinctly longer than depth of tarsus; tergite XI with two fine dentate lateral setae; pedipalps stout, femur 2.1-2.4 (rarely 2.5 or 2.6)(♂)/2.2-2.5 (♀) times longer than broad, pedipalpal femur abruptly enlarged basolaterally; spermatheca consisting of two tubes without apical enlargements *Parachernes nigrimanus*
- 25a Pedipalps slightly more slender, femur 2.5-3.1 (mostly 2.8-3.1)(♂)/2.6-3.3 (mostly 2.9-3.3) (♀) times, patella 2.4-2.6 (♂)/2.3-2.7 (♀) times, chela with pedicel 3.0-3.4 (♂)/2.8-3.3 (♀) times longer than broad; whitish lateral spots on posterior margin of carapace tapering laterally *Parachernes franzi*
- 25b Pedipalps slightly less slender, femur 2.4-2.9 (♂)/ 2.4-2.8 (♀) times, patella 2.0-2.5 (♂)/(2.2-2.5 (♀) times, chela with pedicel 2.4-3.2 (mostly 2.4-2.9) (♂)/2.4-3.1 (mostly 2.4-2.9)(♀) times longer than broad; lateral whitish spots on posterior margin of carapace not tapering laterally *Parachernes galapagensis*

LIST OF ISLANDS AND THEIR RECORDED PSEUDOSCORPION SPECIES

(island data mainly from Peck, 1990, and from www.wikipedia.org/wiki/Galapagos; with surface area and maximal elevation in parentheses.

Baltra (= South Seymour) (25 km² - 50 m)

Aphelolpium longidigitatum; *Serianus* cf. *galapagoensis*

Bartolomé (1.2 km² - 114 m)

Lechytia chthoniiformis, *Neocheiridium galapagoense*, *Parachernes galapagensis*

Champion (NE Floreana) (9,4 ha - ? m)

Serianus galapagoensis, *Cryptocheiridium confundens* sp. n.

Darwin (1.1 km² - 168 m)

Paraliochthonius rupicola sp. n.

Espanola (58 km² - 198 m)

Aphelolpium cayanum, *Aphelolpium longidigitatum*, *Serianus galapagoensis*, *Cryptocheiridium confundens* sp. n., *Parachernes galapagensis*, *Parachernes nigrimanus*

Fernandina (635 km² - 1494 m)

Paraliochthonius galapagensis sp. n., *Paraliochthonius rupicola* sp.n., *Serianus galapagoensis*, *Serianus maritimus* sp. n., *Galapagodinus franzi*, *Garypus granosus* sp. n., *Cryptocheiridium confundens* sp. n., *Neocheiridium galapagoense*, *Parachernes franzi*, *Parachernes galapagensis*, *Parachernes nigrimanus*

Floreana (= Santa Maria) (171 km² - 640 m)

Pseudochthonius galapagensis, *Lechytiya chthoniiformis*, *Ideoblothrus emigrans* sp. n., *Aphelolpium cayanum*, *Aphelolpium longidigitatum*, *Galapagodinus franzi*, *Serianus galapagoensis*, *Neocheiridium galapagoense*, *Parachernes galapagensis*, *Parachernes nigrimanus*

Gardner (at Espanola) (0.58 km² - 49 m) (data from Schatz, 1998)

Aphelolpium cayanum, *Aphelolpium longidigitatum*, *Galapagodinus franzi*, *Serianus galapagoensis*

Gardner (at Floreana)

Pseudochthonius galapagensis, *Ideoblothrus galapagensis* sp. n., *Aphelolpium* sp. (*A. longidigitatum*?), *Neocheiridium galapagoense*

Genovesa (= Tower) (17 km² - 76 m)

Lechytiya chthoniiformis, *Aphelolpium longidigitatum*, *Galapagodinus franzi*, *Serianus galapagoensis*, *Neocheiridium galapagoense*, *Parachernes franzi*, *Parachernes* sp. (*P. galapagensis*?)

Isabela (=Albemarle) (4670 km² - 1707 m)

Paraliochthonius litoralis sp. n., *Paraliochthonius pecki* sp. n., *Pseudochthonius galapagensis*, *Lechytiya chthoniiformis*, *Aphelolpium cayanum*, *Aphelolpium longidigitatum*, *Stenolpium insulanum*, *Galapagodinus franzi*, *Serianus elongatus* sp. n., *Serianus galapagoensis*, *Garypus granosus* sp. n., *Cryptocheiridium confundens* sp. n., *Neocheiridium galapagoense*, *Paratemnoides nidificator*, *Parachernes franzi*, *Parachernes galapagensis*, *Parachernes nigrimanus*, *Rhopalochernes insulanus*

Marchena (173 km² - 343 m)

Aphelolpium longidigitatum, *Galapagodinus franzi*, *Serianus galapagoensis*, *Parachernes franzi*, *Parachernes galapagensis*, *Parachernes nigrimanus*

North Plazas

Aphelolpium longidigitatum, *Parachernes galapagensis*

Pinta (60 km² - 780 m)

Galapagodinus franzi, *Serianus galapagoensis*, *Serianus maritimus* sp. n., *Garypus granosus* sp. n., *Neocheiridium galapagoense*, *Parachernes franzi*, *Parachernes galapagensis*

Pinzon (= Duncan) (18 km² - 458 m)

Pseudochthonius galapagensis, *Lechyttia chthoniiformis*, *Ideoblothrus emigrans* sp. n., *Aphelolpium longidigitatum*, *Galapagodinus franzi*, *Serianus galapagoensis*, *Cryptocheiridium confundens* sp. n., *Neocheiridium galapagoense*, *Parachernes galapagensis*

Rabida (4.9 km² - 367 m)

Ideoblothrus emigrans sp. n., *Garypus granosus* sp. n., *Parachernes galapagensis*, *Parachernes nigrimanus*

San Cristobal (552 km² - 715 m)

Aphelolpium cayanan, *Aphelolpium longidigitatum*, *Stenolpium insulanum*, *Galapagodinus franzi*, *Serianus galapagoensis*, *Serianus maritimus* sp. n., *Garypus granosus* sp. n., *Parachernes nigrimanus*

Santa Cruz (=Indefatigable) (904 km² - 864 m)

Paraliochthonius litoralis sp. n., *Pseudochthonius galapagensis*, *Tyrannochthonius albidus*, *Lechyttia chthoniiformis*, *Ideoblothrus emigrans* sp. n., *Aphelolpium longidigitatum*, *Stenolpium insulanum*, *Galapagodinus franzi*, *Serianus galapagoensis*, *Serianus maritimus* sp. n., *Garypus granosus* sp. n., *Cryptocheiridium confundens* sp. n., *Neocheiridium galapagoense*, *Paratemnoides nidificator*, *Parachernes galapagensis*, *Parachernes nigrimanus*, *Withius piger*

Santa Fé (=Barrington) (24 km² - 259 m)

Paraliochthonius rupicola sp. n., *Pseudochthonius galapagensis*, *Aphelolpium longidigitatum*, *Galapagodinus franzi*, *Serianus galapagoensis*, *Serianus maritimus* sp. n., *Garypus granosus* sp. n., *Neocheiridium galapagoense*, *Parachernes galapagensis*, *Parachernes nigrimanus*

Santiago (572 km² - 905 m)

Pseudochthonius galapagensis, *Lechyttia chthoniiformis*, *Aphelolpium longidigitatum*, *Galapagodinus franzi*, *Serianus galapagoensis*, *Cryptocheiridium confundens* sp. n., *Neocheiridium galapagoense*, *Parachernes galapagensis*, *Parachernes nigrimanus*

Seymour (1.9 km² - 28 m)

Galapagodinus franzi, *Serianus galapagoensis*, *Neocheiridium galapagoense*, *Parachernes galapagensis*, *Parachernes nigrimanus*

Sombrero Chino (0.25 km² - 98 m)

Serianus cf. *galapagoensis*, *Cryptocheiridium confundens* sp. n.

South Plazas (0.13 km² - 23 m)

Lechyttia chthoniiformis, *Aphelolpium longidigitatum*, *Serianus galapagoensis*, *Cryptocheiridium confundens* sp. n., *Neocheiridium galapagoense*, *Parachernes franzi*, *Parachernes galapagensis*

Venecia (close to Santa Cruz)

Aphelolpium longidigitatum

Wolf (1.3 km² - 253 m)

Serianus maritimus sp. n.

CONCLUSIONS

Ten families and 25 species are identified in the examined collections consisting of 509 samples (= 509 localities with highly diversified habitats and various sampling methods) and assembled since 1965, the pseudoscorpion fauna of this archipelago is now quite well known. It is evident from the number of samples that the easily accessible islands, with human settlements and good roads or paths, have been more intensively sampled than the smaller islands, e.g. Baltra, Darwin, Venecia and Wolf wherefrom only one or two species are known from one locality. It is also evident that a survey on the bigger islands with a higher elevation and a higher diversification of habitats yielded a higher number of species, without implying that the size of an island represents the most important factor for the number of species.

The families Chthoniidae (3 genera, 6 species), Garypinidae (2 genera, 4 named species) and Chernetidae (2 genera, 4 species) are the most diversified ones. The most frequent and abundant species are *Parachernes galapagensis* (16 islands, 59 localities, 367 specimens), *Aphelolpium longidigitatum* (15 islands, 66 localities, 109 specimens), *Neocheiridium galapagoense* (15 islands, 39 localities, 115 specimens), *Galapagodinus franzi* (14 islands, 83 localities, 239 specimens), *Parachernes nigri-manus* (11 islands, 59 localities, 76 specimens), *Cryptocheiridium confundens* sp. n. (9 islands, 14 localities, 78 specimens), *Garypus granosus* sp. n. (7 islands, 14 localities, 115 specimens) and *Pseudochthonius galapagensis* (6 islands and 19 localities, but only 37 specimens). All but one (*A. longidigitatum*) are considered as species endemic to the archipelago. One genus is endemic to the archipelago (*Galapagodinus*). The number of endemic species represents four-fifth (20) of the 25 species recorded. Most of the endemic species are widely distributed and found on several islands and isles, which might indicate an early diversification and a long-lasting dispersal activity. Only few species are recorded from one or two islands and from one to three localities only, but this rarity probably has no ecological/biological background, but probably from insufficiently explored habitats. The four *Paraliochthonius* species, but also *Garypus granosus*, have been collected mainly by one collector (S. Peck) using a particular collecting method (cliff spraying). *Serianus elongatus* and *Tyrannochthonius albidus*, known from one locality each, with one respectively two specimens, are likely colonizing the mesovoid shallow substratum (MSS) or lava tubes. These habitats are unexplored on the Galapagos islands.

Only five species out of the 25 recorded ones have their original distribution area outside the archipelago and are evidently introduced. *Lechytia chthoniiformis* and *Paratemnoides nidificator* are widely distributed on continental South America, but also in the Caribbean and in Central America. Whereas the former species seems to be well adapted to the archipelago and has been recorded from eight islands by five different collectors, the latter one apparently subsists but could not colonize the archipelago due to unsatisfying habitat conditions. *Aphelolpium longidigitatum* and *A. cayannum* are known from the Caribbean area and Florida. *Withius piger* is a cosmopolitan species and was probably introduced quite recently to the Galapagos islands by human activity.

Five species are halophiles living exclusively at the seashore and on the sea cliffs (*Paraliochthonius* spp. n., *Garypus granosus* sp. n.). Most of the other species

are recorded from various habitats from the littoral zone up to 1300 m altitude (mainly humus and litter), but are apparently adapted to the littoral zone with its adjacent habitats (mangrove litter, etc.). The presence of nearly all species in the littoral zone indicates that rafting represents an important dispersal mechanism.

Another principal natural dispersal mechanism within the archipelago might be phoresy by birds or, more reasonably, by transport of nesting material (branchlets, hay, lichens or moss). It is amazing to note that the most abundant and the most widely distributed species have been found also in or under bird nests or seabird rookeries: *Galapagodinus franzi*, *Serianus galapagoensis*, *Cryptocheiridium confundens* sp. n., *Parachernes franzi*, *P. galapagensis* and *P. nigrimanus* (but not *Neocheiridium galapagoense*!). Furthermore, *Galapagodinus franzi* was found frequently on vegetation (up to 3 or 4 meters height on *Scalesia*, in moss and epiphytes), which can facilitate transport in nesting material by birds. On the other hand, *Lechyttia chthoniiformis* and *Paratemnoides nidificator*, which are frequently found under bark and in litter, never have been recorded in association with birds (Turienzo *et al.*, 2010). Both species have been recorded as phoretic on different insects (mainly Coleoptera) in Amazonia (Aguar & Bührnheim, 1998). Phoresy on insects seems to be a supplementary way of dispersal for *Galapagodinus franzi*, *Serianus galapagoensis* and *Parachernes nigrimanus*, since these species have been collected in Malaise traps, using UV light during night catches, and in flight interception traps. *Paratemnoides nidificator* has been caught once in a Malaise trap, as have been a few specimens of *Aphelolpium cayanum* and *A. longidigitatum*. Dispersal of species within the archipelago is influenced, too, by human activity. Agriculture has had a certain, but unquantifiable impact, either by plantations or by pastures, since on four of the five inhabited islands agriculture is practised. Unintentional introductions with agricultural goods from the mainland must also be considered (Schatz, 1998).

The origin of the pseudoscorpion fauna of the Galapagos archipelago cannot be assessed without a “touch” of speculation, since our knowledge of the pseudoscorpion fauna of the Pacific slopes of Central and South America, particularly that of Ecuador and Colombia, is fragmentary. A close affinity with the fauna of the Caribbean area (Greater and Lesser Antilles) seems to be evident. All families and genera recorded from Galapagos are also known from the Antillean islands, besides the already mentioned *Aphelolpium* spp., and particularly *Cryptocheiridium confundens* sp. n. and even *Stenolpium insulanum*. This might be explained by the existence of a broad sea connection between the Caribbean region and the eastern Pacific area from 48 my ago until 3.5–3 my ago, with a sea current running from the Atlantic to the Pacific. The Panama isthmus rose some 3 my ago by uplift of the Caribbean Plate, closing the gap between the North and South American plates (see Baert, 2013). Accepting this hypothesis, *A. longidigitatum*, *Garypus* sp. and some Garypinidae (*Galapagodinus franzi*, *Serianus galapagoensis*) might have been among the first pseudoscorpions to arrive and colonize the archipelago. After closure of this dispersal route, some other species (e.g. some *Paraliochthonius* spp., and *Garypus* sp. might have originated also from the Pacific coast of Mexico (Baja California) and Central America.

In accepting the Caribbean as the main origin of the present pseudoscorpion fauna of the Galapagos, it can be considered as harmonious compared to the pseudo-

scorpion faunas of the adjacent regions. The (quasi) absence of some taxa is amazing, but does not invalidate this appreciation. The number of taxa of the family Cheliferidae is decreasing in North America from north to south. It is represented by a few taxa only in the Caribbean region and it is definitely absent from South America (except for the cosmopolitan *Chelifer cancroides* Linnaeus, 1758). On the other hand, the family Withiidae is poorly represented by *Withius piger*, a cosmopolitan species. Other genera and species of this family are absent from the archipelago. This fact is puzzling, since several genera of this family (e. g. *Dolichowithius* Chamberlin, 1931b, *Parawithius* Chamberlin, 1931b and *Victorwithius* Feio, 1944) are quite diversified on the South American continent and represented also with a few species in the Caribbean area and in Central America. This absence, as that of some chernetid genera (e.g. *Lustrochernes* Beier, 1932 or *Cordylochernes* Beier, 1932) is perhaps due to either a reduced survival potentiality of those taxa during an extended period of dispersal by rafting or to the presence of a hostile environment on the Galapagos islands. Flood debris may take about 2-4 weeks to reach the islands from the South American mainland (Thornton, 1971, cited by Schatz, 1998). Species of these genera are known to be bark-dwelling and phoretic on flying insects.

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